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A STUDY OF BENEFITS RESULTING FROM
THE AFIT
EDUCATION WITH INDUSTRY PROGRAM

THESIS

Ed R. Hernandez
Captain, USAF

AFIT/GSM/LSR/89S-18

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Finally, I must mention my deep indebtedness to my thesis advisor, Lt Colonel Lindsey. His perceptive insight, endless patience, and perseverance were major factors in the writing of this thesis. Near the end when other thesis students also required his guidance, Lt Colonel Lindsey's constructive feedback and timely responsiveness were critical to the completion of this product. I am indeed grateful for his contribution to this research experience. Thank you.

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THESIS

Presented to the Faculty of the School of Systems and
Logistics of the Air Force Institute of Technology

Air University

In Partial Fulfillment of the
Requirements for the Degree of
Master of Science in Systems Management

Ed R. Hernandez, B.B.A.

Captain, USAF

September 1989

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Acknowledgments

Families and loved ones always seem to play a big part during a person's most stressful times - even more so for this single person. My "family" during AFIT developed from an initial study group with Ed Lorenzini, Derrick Richardson, Rob Shell, and later Rick Wojick. From statistics with Dan Reynolds to finally ringing the bell, these men have been an abundant well of prayers, support, and friendship. I must also mention others for their special loving, caring, and nurturing during my stay at AFIT - Dana and Rod McAlear, Mark and Karen Donahue, George Sarmiento, and Tom Wiggs. To all of you goes a very warm and special thank you.

Even with this great family, my graduation would not have been possible without the excellent, professional support by the AFIT staff. This list includes my academic advisors, Major Triscari and Lt Colonel Cook, the LS library staff, the computer personnel, and the LSG staff.

Similarly, the success of this research relied upon a team effort. I am especially thankful for the sponsor of this research effort, Lt Colonel Mary Mayer, and her support. A sincere thanks also goes to Dr. Weaver for his responsive review of the research survey. Thanks must also go to Jean for her encouragement and literature research efforts and to Tina for her typing skills which made the writing part easier for me. Next, a special thanks to Mrs. Sawyer and Dr. Fenno - whose dedication and professionalism made this thesis possible.

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Abstract

This research developed a survey based on a summative evaluation framework to measure the value of the Education With Industry program. A review of the literature revealed that evaluations of management development programs suffer from a lack of objective, quantitative measures and a subsequent lack of generalizability of the evaluation results. More importantly, Tracey asserts management program evaluations suffer from a lack of ordered and valid appraisal standards. Using the summative evaluation approach, this research collected several psychometric properties from previous studies and incorporated them into a well-developed field survey.

A three-part questionnaire was developed to measure the attitudinal differences between the treatment group of EWI graduates and a comparison group consisting of similar Air Force contracting/manufacturing officers not having attended EWI. The developed field survey consisted of three parts. Part I, consisting of demographic items, was to be answered by all personnel receiving the survey. Parts II and III were to be answered only by those officers attending EWI in the manufacturing or contracting options, respectively. A pilot study determined the appropriate items and wording most suitable for the field survey. Next, the resulting field survey was administered to the EWI graduates of the 1983-1987 classes as well as a comparison group consisting of similar Air Force contracting/manufacturing officers not having attended EWI. Respondents were asked to describe their attitudes

toward their work, their organization, and their intent to remain in the Air Force for 20 years.

The returned responses were evaluated for the internal reliability of several composite measures. Next, several data analysis procedures were conducted to test the proposed hypotheses. The study concluded further research, based on a formative study using Mohr's systematic outcome line and subobjectives, was required to objectively and quantitatively assess the value of the EWI program.

A STUDY OF BENEFITS RESULTING FROM
THE AFIT EDUCATION WITH INDUSTRY PROGRAM

I. Introduction

The Air Force Institute of Technology (AFIT) Education With Industry (EWI) program is a management development program jointly-sponsored by AFIT and industry that develops Air Force officers' and civilians' abilities for effective management and leadership skills to fill key Air Force management positions. The EWI program consists of on-the-job education and experience within the civilian industry environment "to provide an understanding of organization structure, management methods, and the technology of modern industry" (USAF, 1986). Upon the conclusion of the 10-month EWI program, the Air Force assigns the EWI participants to duty positions consistent with their education.

Background

With an overall trend of a decreasing DOD budget, the Air Staff has been forced to make cuts in many areas, including education programs such as EWI. In the past year, the Air Staff cut the EWI authorizations from 125 to 44, and is contemplating eliminating the program. These adverse actions have prompted EWI advocates to vocalize their support for the EWI program's continuance; however, the Air Staff has requested "hard" evidence that EWI is a valuable benefit to the Air Force. Evaluating the benefits or value of this 10-month industry education should help the Air Force decide whether or not to continue the EWI

program. More importantly, this study should identify possible ways to improve the program's overall value to the Air Force. Thus, the study of EWI participants' educational experiences with private industry and the resulting findings are valuable to the Air Force's efforts for developing its officers to meet the Air Force's overall organizational objectives.

Problem Statement

The Air Staff asked the EWI program manager (and sponsor for this study), Lt Col Mary Mayer (AFIT/CIS), to evaluate the EWI program and determine any added value or benefit to the Air Force. Accordingly, this research will identify and measure several qualitative benefits. As a result of this process, the research should determine the added value or benefit of the EWI program based on the educational experiences of officers previously attending EWI. Specifically, since the majority of each year's EWI students consists of contracting/manufacturing officers, this study will investigate the benefits of EWI with respect to this Air Force career field.

Research Objectives

This research is expected to determine any direct benefit to the EWI participants and subsequently, any indirect benefit to the Air Force from the EWI program. Additionally, the research should provide recommendations for improving these benefits, the EWI program, and future evaluation procedures.

Research Questions

This study poses the following research questions: What is the relationship between an officer attending EWI and his/her intent to remain in the Air Force? Do officers attending EWI exhibit more positive attitudes regarding their work than officers not attending EWI? How does an EWI graduate's self-rated job performance compare to his/her contemporaries who did not attend EWI? How do EWI graduates view their experience with private industry?

Hypotheses

To answer the above questions and determine the value of the EWI program to the Air Force, this research must identify and measure relevant variables. Thus, the hypotheses are:

Hypothesis 1. Contracting/manufacturing officers participating in EWI exhibit a higher degree of intent to remain in the Air Force than contracting/manufacturing officers not attending EWI.

Hypothesis 2. Contracting/manufacturing officers participating in EWI exhibit more positive attitudes regarding their work than contracting/manufacturing officers not attending EWI.

Hypothesis 3. A majority of contracting/manufacturing officers graduating from EWI receive unique private industry education and knowledge.

Hypothesis 4. A majority of EWI graduates view their private industry education as an overall positive experience.

In summary, shrinking Department of Defense budgets for management education and development programs such as the Air Force Institute of Technology's Education with Industry program have caused DOD decision-makers to question its value to the Air Force. Eventually, this value judgment must weigh these benefits with respect to their costs, such as relocation and temporary loss of manpower costs. To assist in this management decision, this research proposes to evaluate potential

benefits to the Air Force, suggested by current literature on management education and development and the conceptual framework for such an evaluation. The following literature review identifies appropriate variables for measurement as well as validity tests for these hypotheses.

II. The Conceptual Framework

This chapter introduces, discusses, and provides a rationale for the conceptual framework which serves as the basis of this research study. As an introduction, the discussion will describe the importance of management talent and its development as a critical resource through a variety of training, education, and development programs. Furthermore, to evaluate or assess the impact of EWI upon the Air Force, it is essential to initially establish a proper framework of the program with respect to concepts such as education, training, and learning. Having conceptually established the management development role of EWI as an Air Force management education program as well as its objectives and methodology for achieving them, the discussion focuses on the concept of evaluation: its purpose, necessary assumptions and principles, various approaches and methods, and limitations. Finally, the discussion closes with a look at evaluation success, its benefits and utilization.

Introduction

One of the important tasks facing organizations is the development of their most critical resource - management talent. Without this essential development for future management, organizations may not enjoy continued growth and survival (Black, 1979; Parry and Robinson, 1979).

Development programs can satisfy individual, group, and organizational needs. From an individual viewpoint, managers need development programs to make them more effective in their current job, to prepare them for more challenging jobs in the future, and to extend

their years of service/usefulness to the organization (Black, 1979). Development programs for groups of similar level managers or job functions can promote team building through shared experiences or knowledge (Hawrylyshyn, 1983). Lastly, an organization needs development programs to maintain a supply of managers for top-level positions, to inform managers of changes in organizational operations, and to help the organization adapt to its changing operating environment (Black, 1979).

Discussion

Viewing human resources (and their development) as a system, the management development subsystem is comprised of activities striving to improve the effectiveness of meeting organizational goals (Lusterman, 1977; Hawrylyshyn, 1983). Such activities include any attempt to improve managerial performance through providing information, improving attitudes, increasing skills through on-the-job experience, classroom training, job rotation, or special assignments (House, 1967; Hawrylyshyn, 1983).

In an attempt to meet their goals, organizations discover perhaps their most important need is competent human resources or people. To satisfy this need, many organizations design management development programs which:

- 1) help current managers become more effective,
- 2) provide successors to current managers, and
- 3) provide additional managers to meet their expansion needs.

Generally, such programs focus on several topics such as management theory, planning, setting objectives, leadership skills, organization theory, and motivation theory. However, senior management must provide long-term commitment and support to the development programs in order for them to be successful (Tracey, 1984; Pence & Reed, 1983).

Education versus Training

To evaluate the EWI program, one must first understand the distinction between education and training, the various components of management development, and the concept of learning. Understanding these concepts and their purposes, goals, and objectives will help in this evaluation. Whitehead wrote "the purpose of education is to stimulate and guide a student's self-development" (Whitehead, 1957). He also described the "rhythm of education" concept - "different subjects and modes of study should be undertaken by pupils at fitting times when they have reached the proper stage of mental development" (Whitehead, 1957). This rhythm concept meshed with his stages of intellectual progress: romance, precision and generalization. Whitehead described the romance stage as the first exposure to new, unexplored information or novel viewpoints. Later, one enters the precision stage emphasizing exactness and striving to acquire other facts in a systematic order. Whitehead viewed the third stage, generalization, as a return to romanticism with the added advantage of previous ideas and acquired techniques of the precision stage.

With self-development as education's purpose, Whitehead defined education as "the acquisition of the art of the utilization of knowledge" (Whitehead, 1957). Thus, he viewed education as the process

of teaching the application of knowledge. Livingston supported this premise as he wrote "Merely having knowledge is not enough, one must also possess the skills of application to follow through on the acquired knowledge" (Livingston, 1983). Parry and Robinson further described education as being concerned with broad, general objectives such as values, attitudes, and perceptions. In this view the student gains understanding from education, rather than skills (Parry & Robinson, 1979). Additionally, Laird defines education as "an attempt to improve the employee's overall competence in a specified direction beyond the job now held" (Laird, 1985). Thus, traditional education's key parameters appear to be its direction and range beyond a specific job toward "learning to think and to examine and solve problems" (Hawthorne, 1987).

On the other hand, training differs from education in that:

traditionally, training was distinguished as a field concerned with teaching practical skills for a specific purpose; however, training now refers to activities ranging from the acquisition of simple motor skills to the development and change of complex socio-emotional attitudes. (Bass, 1966)

Training concerns specific, job-related behaviors such as procedures, rules, techniques, and acquiring skills (Parry & Robinson, 1979; Marsick, 1987; Warren, 1969; Hawthorne, 1987). Thus, training is one of the many tools available to a company to help it reach its goals and is also viewed as an investment in the company's most valuable resource - its people (Bass, 1966; Parry & Robinson, 1979; Warren, 1969; Black, 1979).

Although it is not always possible to clearly distinguish between education and training, using a linear scale approach may help with the distinction. Defining one end of the scale as training, one would

typically encounter "measurability, narrow scope in subject matter and its range of use, relationship to a specific time and place, and an efficient transfer of information" (Branscomb & Gilmore, 1975). The other end of the scale, being more characteristic of education, one encounters:

exposure to contrasting assumptions and points of view, the involvement of personal and intellectual initiative, a broader range of use and even an uncertainty about its specific utility, and the general impossibility of measuring on a quantitative scale the degree and quality of acquisition of insight. (Branscomb & Gilmore, 1975)

Generally, "education concerns information, concepts, and intellectual abilities, while training involves acquiring skills through repetition in performance" (Lusterman, 1977).

Two other authors give additional views on training. Lusterman provides Buckingham's distinction:

training develops certain automatic facilities as in languages, bookkeeping, and the operation of machines, while education provides the student with the capacity for analyzing and solving problems confronting him in his occupation, his society, and within himself. (Lusterman, 1977)

Using a systems context, Laird establishes the four inputs required by an organization to produce an output: people, technology, materials, and time. Subsequently he defines training as "the acquisition of the technology (a necessary system input) which permits employees to perform to standard" (Laird, 1985).

Thus, with the preceding discussion, the literature supports the accepted notion that EWI "educates" rather "trains" a contracting or manufacturing officer. Subsequently, the concepts of learning (active and passive), metacognition, and strategies for learning were reviewed.

The following discussion presents the findings of this review of the literature and their relevance to the EWI program.

Concept of Learning

Learning focuses on the manner in which people acquire new knowledge and skills, and the manner in which the existing knowledge and skills are modified. In defining learning, three criteria have appeared in nearly all conceptions of learning:

1. A change in behavior or ability
2. This change must result from practice or experience
3. The change must be long-term.

The second and third criteria exclude certain behavioral changes not considered learning, such as emotional or physical maturity or the temporary effects of drugs (Shuell, 1986). According to Shuell, the main difference between this "behavioral" concept and Langley and Simon's "cognitive" learning perspective is the emphasis on the performance of a system rather than on the individual and his or her behavior (Shuell, 1986).

This apparently minor difference between the behavioral and cognitive concepts of learning is significant and Shuell cites Stevenson's observation to explain it. Given that knowledge is what a person learns, then the change in behavior must be a result of learning rather than a result of learning a change in behavior (Shuell, 1986).

In essence then, EWI participants are expected to exhibit a change in their behavior regarding contracting/manufacturing management duties as a result of their private industry education and experience rather than as a result of learning the behavior itself. There are other

differences between the two learning concepts worth mentioning. The behavioral approach focuses on changing the environment to influence the learning, while the cognitive approach focuses on changing the learner through encouragement. Thus, the former approach provides positive reinforcement upon correct response to influence learning, while the latter approach uses feedback. It is useful to investigate the influence of cognitive psychology on education and learning, since cognitive psychology concerns mental activities such as perception, thinking, and memory and their relationship to human information processing and problem solving (Shuell, 1986).

Emphasizing mental processes and knowledge structures as well as behavior, cognitive psychology views learning as an active and constructive process with higher-level processes. Additionally, cognitive psychology acknowledges learning as a cumulative process and the role played by prior knowledge (Shuell, 1986).

Active Learning. The cognitive approaches emphasize learning as an active, constructive process working toward goals and dependent upon the learner's mental activities (Lusterman, 1977). This view contrasts with the behavior approach which requires mostly a passive learner response to external environmental factors. Although both situations lead to an overt response or behavior, the two approaches differ in that the behavior approach requires a response for reinforcement while the cognitive approach focuses on the mental activities of the learner leading up to the overt response or behavior. Additionally, the cognitive approach acknowledges the role of planning and setting goals (metacognitive processes); the attempt to organize the material being

learned; the generation of the response; and the use of various learning strategies (Black, 1979; Shuell, 1986).

Metacognition. A majority of cognitive learning approaches recognize that two types of metacognition, or hierarchical, psychological processes, are responsible for learning (Shuell, 1986). The first type concerns the arrangement and control of activities required for successful learning. The activities may include planning, predicting what the information will be, and monitoring the learning process. These actions help achieve goals, thereby reinforcing learning as a constructive process working toward a goal (Shuell, 1986).

The second type of metacognition concerns the familiarity with the new information and the learning processes involved. In learning tasks, knowledge about the type or nature of task influences performance of the task. Likewise, knowing one's skills, strengths, and weaknesses helps in learning. Meanwhile, strategies and interactions processes are involved in learning, too. Knowing the differential value of alternative strategies enhances performance; furthermore, knowing how the various types of previous knowledge interact with each other to influence the outcome of a cognitive process (Shuell, 1986). These writings also support the nature of the EWI program as an "experiential" education since EWI relies on the participant becoming an active member of the corporate team and the daily interaction with the host company's personnel.

Role of Prior Knowledge. Since learning is cumulative, nothing can be learned or have meaning in isolation. In learning, one's prior knowledge creates boundaries for sorting the new information into "same"

or "unique" categories. Thus, prior knowledge plays a very important role in acquiring new knowledge within cognitive learning concepts (Shuell, 1986). Accordingly, each contracting/manufacturing officer attending EWI either has previous specialty experience or attends an extensive, basic specialty course prior to attending EWI. Thus, this arrangement should help to maximize each officer's EWI experience.

What is Learned. What an individual learns differs between the behavioral and cognitive learning concepts (Shuell, 1986). The behavioral approaches indicate that the learner either forms associations between a stimulus and a response or what the learner absorbs internally has absolutely nothing to do with what is learned (a change in behavior). Conversely, the cognitive approaches emphasize the acquisition of knowledge rather than learning a behavior. According to Shuell, to acquire knowledge, many of the cognitive learning theories specify three conditions.

1. collection of new information
2. combination of different pieces of the new information
3. relating new with old information (Shuell, 1986)

With the aforementioned role of prior knowledge, EWI appears to support these conditions, thereby strengthening the educational experience.

Implications. Having determined EWI as an educational experience involving an active learning process, the host company's mentor/teacher's basic task involves more than disseminating information. Instead, the mentor must engage the EWI participant in learning activities. As a result, what the student does actually has more impact on the learning process than what the teacher does. These

facts support the EWI learning experience: you get back what you (the student) put into it.

Strategies. During the EWI experience, officers may use three basic learning processes in their self-education; they can either acquire or absorb, experience, or explore new information (Dill, 1967). In the acquisitional process one acquires or absorbs knowledge, opinions, or skills by reading or listening. For example, a manager may acquire information or facts about how something works, where such techniques have been used, and the level of success in those cases. However, if there are no experts to consult or the information is difficult to understand and use, this approach may not be adequate for the manager's self-education.

When the acquisition approach does not meet his needs, the manager may use the experiential learning strategy. In this case, one learns by initially acting, watching, and listening for results then later reflecting on the relationship between what was expected and what actually occurred. In this manner, experiential learning builds on the acquisition strategy since the manager relies upon personal experience to guide his/her actions. The manager uses personal abilities and motivations to tailor the information from external sources and apply it in a particular situation. In this way, experience limits self-education since the lessons from experience, as well as expert advice, are based on the past. With the quickening pace of his environment, yesterday's solution may not suit the manager's problems of today or tomorrow.

Exploratory learning may be appropriate when the manager encounters unfamiliar problems, or high costs for expert advice or experience. Here the manager initiates a deliberate, organized search for information and experience which involves formulating questions, testing hypotheses, and running experiments. The manager's objective may be to obtain answers or merely the ability to formulate better questions or hypothesis.

Given the previous discussion of the literature, the study has identified EWI as an educational program emphasizing active learning while requiring some previous knowledge of the subject matter. Additionally, the student is responsible for his/her education and may be require to use all three basic learning processes during the EWI experience.

The following text addresses the role of education and training within the human resources development context, describes management development, and provides a brief history as well as trends in the 1980s. Then the discussion continues with an investigation of the corporate education model and future areas of educational emphasis.

Human Resources Development

Previously identified as training and development, current literature uses the term "human resource development" to include all the learning experiences provided to employees to facilitate behavior changes that promote the achievement of an organization's goals and objectives (Tracey, 1984). Human resource development (HRD) includes programs such as executive development, management and supervisory development, and scientist and engineer development (Tracey, 1984).

This study will focus on the management development activities within the HRD context.

Successful organization development (OD) approaches tend to encompass and build upon the individual education, development, and training aspects mentioned rather than ignoring or countering them (Hawrylyshyn, 1983). Thus, the human resource development activities would support the objectives of organization development:

to change and improve an organization's management and operation to increase its effectiveness, productivity, return on investment, quality of worklife, and employee job satisfaction. (Tracey, 1984)

Organization development, as qualitative activities, focuses on behavioral changes aimed at improving relationships, communication, team work, and changes in managerial styles rather than focusing on quantitative techniques. Figure 1 presents this hierarchy model of organizational development.

Management Development. The management development process includes several related and overlapping activities which ultimately strive to improve the effectiveness of the organization: management training, management education, and organization development. Management development encompasses the complex process of planning and programming for the growth and improvement of an organization's managers (Hawrylyshyn, 1983; Black, 1979).

Within the management development process, the goal of management education is to develop a broad range of a manager's abilities through increased knowledge, attitudes, and skills that are not task or organization specific. Management education's scope is broader and provides a longer time of usefulness than management training.

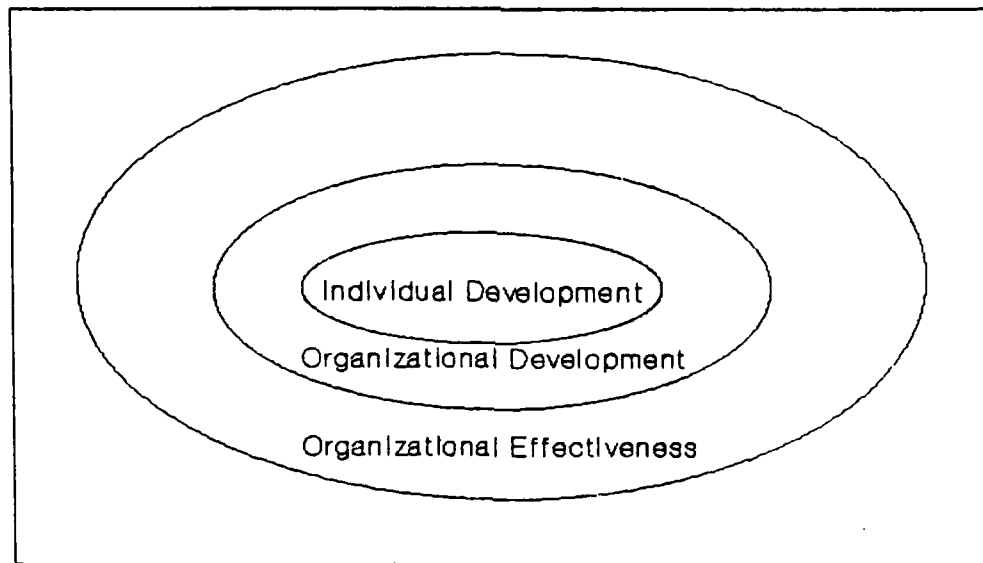


Figure 1. Hierarchy of Organizational Development

More specifically, management education tries to awaken, stimulate, develop, and increase capacities of a manager's potential as a human being (Black, 1979). Thus, management education is oriented more toward the individual rather than to a job or task (Hawrylyshyn, 1983).

Similar to the previous training discussion, the goal of management training is to develop very specific and immediately useful skills thus preparing trainees to perform well-known tasks in well-defined job settings (Hawrylyshyn, 1983). Organizations offer training classes or courses to managers with similar job functions or management levels. Here the managers receive training tailored to the organization's operations (Black, 1979).

Most large organizations provide four types of formal training: entry-level, remedial, upgrading or advanced, and retraining. The entry-level training includes orientation for newly hired personnel. Organizations design these programs to prepare the newcomer for initial job performance in their new workplace. Later, remedial training, if necessary, provides instruction to correct deficiencies in knowledge, skills, or attitudes (Tracey, 1984).

To improve employee skills and knowledge, organizations design upgrading or advanced training activities to improve or update job skills and knowledge. Should changes in technology, equipment, processes, or products make current employee skills obsolete, organizations can retrain them with new skills to replace the old ones (Tracey, 1984).

History. Early in the 1920s, organizations used training to enhance their effectiveness of operations. Training helped improve

their selection and placement of employees, reduce turnover, and improve productivity. Later in the 1950s, growing corporations increased their interest in management development and focused on liberal educational experiences for top level executives. By 1958, orientation became the most common human resource development program with its purpose being to retain adequate human resources by reducing attrition and promoting loyalty to the firm. By the 1970s, the focus shifted to the formalization of course work by some corporations, some even creating their own "corporate colleges" (Hawthorne, 1987).

Trends in the 1980s. Organizations have shifted emphasis from a potpourri of courses offered at various times toward a systems approach integrating organizational and human resource objectives and needs (Hawthorne, 1987). With the advent of formal budget planning systems in the 1970s, organizations in the 1980s recognized the need to include human resource development and organization development as elements of their strategic management process thereby integrating them with their overall strategic planning. The resulting management development programs will increasingly focus on behavioral changes which can be measured on both needs assessment and evaluation purposes (Pence and Reed, 1983).

These trends can thus better support organizational objectives and performance (Taylor, 1983). Another concern is providing managers with adequate computer skills to function in a more computerized environment. Finally, HRD managers are increasing the emphasis on team building and participative decision-making for large firms and large projects (Pence and Reed, 1983).

In conjunction with this emphasis toward HRD, in 1972 Livingston wrote about the "myth of the well-educated manager" where he pointed out three shortcomings of this management development push.

1. Managers learned to analyze other people's problems rather than their own.
2. Managers learned to problem-solve rather than problem-find.
3. Managers learned how to work with money rather than with people.

By 1983 Livingston reported only minor improvements in management development (Livingston, 1983). After observing several pressures upon private industry, he advocated an immediate overhaul of the management development process within private industry. The major consideration was economic pressure. Faced with sharply rising costs of management education, organizations increased the scrutiny of these budgets, frequently resulting in cuts. Additionally, with the perception of management development as "something good" and "nice to have", private industry had to rely on overhauling its own HRD systems rather than relying on America's business schools to meet its OD needs (Livingston, 1983; Taylor, 1983).

The changing nature of the work force has made a manager's traditional development through job rotation less commonplace.

Several reasons are:

1. This new generation of managers tend to be much more interested in personal values than in corporate goals and objectives.
2. These managers tend to be less loyal to a specific employer and thus are more likely to change jobs or even career tracks than before.
3. The growth of dual-career couples or families has led to a resistance to career moves every few years.

4. Many organizations can not afford the increasing costs of moving expenses such as a loss of equity or mortgage differentials.

Finally, the high cost of travel further dictates a change in management development with respect to location and accessibility (Livingston, 1983).

Confronted with these trends and pressures, organizations must focus most of their HRD activities toward the wave of the future - the "learning convenience" concept. Supported by the emerging communication technologies, this concept provides portable education and training for either individual or group learning which is accessible 24 hours a day without requiring a qualified instructor. However, the urgent need is for new instruction focusing on the "application of knowledge" rather than just knowledge (Livingston, 1983). This new instruction concept, applied management development, relies on three essential elements: relevance, application, and payoff.

Relevance. Given that all development is self-development, applied management programs are considered relevant by the participants (Pence and Reed, 1983). Furthermore, down-scoping the focus from "general" to "organization-specific" and manager-specific" directly impacts the job relevance element (Pence and Reed, 1983).

Application. Effective management development programs rely upon a conversion of new understanding into practice within the respective individual. The participant must analyze his/her capabilities with respect to performance problems and opportunities. Thus managers can understand how they manager now and how they want to manage in the future. Additionally, fours factors must be present for the conversion

to occur. The individual must want to change and this change must enhance the individual's ego. A third factor requires the new behavior to be goal-directed and defined by objectives. The fourth and most important factor requires the organization and its upper management support this application of new skills and behavior (Livingston, 1983).

Payoff. In order to demonstrate a return on investment, HRD managers must achieve measurable results or benefits. They should target their programs to have a direct impact and contribution to the organization's overall performance or productivity. As a result, HRD managers help dispel the widely-held misconception regarding the uncertainty of a return on investment for management development (Stolz, 1967). Thus, the HRD department gets top level management attention and support, and the budget to fund its programs (Livingston, 1983).

Corporate Education as Model. Corporate education systems have three characteristics differentiating it from the more traditional educational systems. The first difference is the corporate education participants are highly motivated due to the potential rewards of future earnings, prestige, self-esteem, and the realization of career goals (Lusterman, 1977).

A second characteristic is that the workplace is the setting for the learning and the application of knowledge. This situation reinforces Livingston's elements mentioned above: relevance, application, and payoff (Lusterman, 1977). The third characteristic is its role as a means for achieving other corporate goals for profit and growth and its role within the HRD system (Lusterman, 1977).

Areas of Emphasis. Given this discussion, future HRD emphasis is likely to include the the following areas:

Information technology

Technology conversion

Basic management skills

Project groups working on real tasks (active learning)

Communication skills

Career development

Self-development (Taylor, 1983).

Why Evaluation?

As noted earlier, the number and cost of HRD programs has grown significantly since the 1970s. Since the actual dollar cost as well as the associated opportunity costs are borne by the respective organizations (Andrews, 1966; Tracey, 1968), many top-level managers have been saying: "How do we appraise the effectiveness of such programs and rationally justify the expenditure of executive time and company money?" (Andrews, 1966), or "We have to start justifying it (training) in terms of measured results" (Lusterman, 1977). Preferably this desired quantified return on investment should occur before rather than after the commitment (Andrews, 1966). Further, a few economists have suggested the idea that "whether management development is an investment or expense depends only on whether the employees remain with the firm long enough to provide it benefits greater than the cost incurred" (Lusterman, 1977).

Although there have always been some sort of assessment to determine whether development pays off, the evaluation methods have not

been systematic, comprehensive, objective, or accurate. Furthermore, the evaluation results have been insufficient in demonstrating the effectiveness of development programs partly due to the lack of clear program objectives and goals (Hawthorne, 1987). Even though some organizations have attempted to evaluate development programs using rather informal methodologies, they have not been very useful to the HRD managers or top-level executives nor does it appear obvious that better trained or educated managers are assets to the company (Tracey, 1968).

From a training and development perspective, evaluation is essential in controlling the activity by determining its progress with respect to an established baseline. Alternately, evaluation is also important in determining the "value" or benefits of these programs to the organization and assessing their efficiency, effectiveness, and utility. As a result, HRD managers can better defend these activities by knowing the accomplishments and contributions to the organization's goals and also gain the support of upper management. Additionally, management can use evaluation to improve these programs as needed (Tracey, 1968). Evaluation, or evaluation research, is a managerial tool primarily conducted to assist management's decision-making in a specific setting (Hawthorne, 1987).

Definition. Tracey defines evaluation as "a systematic means of assessing the extent to which training and development plans have been carried out and objectives achieved" (Tracey, 1983).

Additionally, Bass believes evaluation can determine whether the outcome of a training and development program is related to the achievement of organizational goals (Bass, 1966). Tracey further states that evaluation

asks questions to find answers regarding deviations from plans; the existence of HRD deficiencies, their extent, and their causes; and selecting the most effective corrective action for remedying the deficiency (Tracey, 1983).

Assumptions. The need for evaluating development programs is based on several fundamental assumptions.

1. The efficiency and effectiveness of programs must be objectively determined to demonstrate their value so they can be retained. Thus, the programs must be validated.
2. Since no development program is perfect, further improvements are possible. Even though a program's effectiveness has been proven, management can make it better.
3. The improvements can be effected by an objective and coordinated evaluation of the entire program; using imagination and creative thinking; thoroughly collecting ideas and observations, critically analyzing and synthesizing the ideas, findings, and options; and an overall systematic, timely testing of policies and procedures plus identifying the resources (people, facilities, funds, materials) needed to implement the procedures (Tracey, 1968).

Principles. Effective evaluation must be conducted so that it is consistent with the goals and objectives of the development program and is in accordance with established evaluation principles (Tracey, 1968).

The following principles should guide all evaluation efforts:

1. Evaluation must be planned. Management must consciously design and schedule the evaluation. Its plan must specify what is to be evaluated, when, how, and by whom.
2. Evaluation must be relevant. Management must evaluate with respect to purpose and objectives relating to the organization.
3. Evaluation must be objective. Management must avoid opinion, emotion, and subjective judgment. They must use fair, reasonable, and measurable standards.
4. Evaluation must be verifiable. The results must be reliable which can be confirmed by other evaluation techniques or by replication of the initial evaluation.

5. Evaluation must be cooperative. The evaluation effort should involve all who are a part of or are affected by the training and development program.
6. Evaluation must be continuous. It must be an ongoing, daily process, although its form or focus may change.
7. Evaluation must be specific. It must be explicit and exact, and deal with specific program elements.
8. Evaluation must be quantitative. It must use numerical measures when possible.
9. Evaluation must be feasible. It must be possible to conduct without interrupting daily operations and it must be administratively manageable.
10. Evaluation must be cost-effective. The results must be worth the resources used. (Tracey, 1983)

Process. According to Tracey, the evaluation process consists of four phases. In the first phase, management determines the specific aspects of the HRD system to be evaluated. Next, the managers select the means and instruments to collect the data. After their collection, the data must be tabulated and summarized. In the final phase, the data is analyzed and interpreted allowing management to offer recommendations and to design and implement an improvement plan (Tracey, 1984).

Types of Evaluation

Regardless of the approach or method used, evaluations fall into two classifications: summative and formative (Gremlich, 1981). The former classification concerns itself with determining whether a program works or not, i.e., does it accomplish its objective(s)? Typically summative studies are conducted prior to initiating a program to determine whether or not it should be implemented; however, such evaluations can be helpful in determining whether to continue a particular project (Gremlich, 1981). On the other hand, formative

evaluations are used to determine whether an existing program could be improved. Accordingly, this study will use a summative evaluation to determine whether to continue the EWI program.

Approaches. Hawthorne (1987) presents a "family tree" of evaluation research to build a foundation for discussing the available approaches. Her family tree displays the basic roots, approaches, and some resulting methods of evaluation research. Arising from the three roots are the three broad categories of evaluation methodology - program evaluation, benefit-cost analysis, and decision analysis. Additionally, a variety of methods have been developed within each broad category (Hawthorne, 1987).

Methods. Hawthorne's family tree also displays the five most frequently used methods. They are impact analysis, process analysis, cost effectiveness analysis, cost efficiency analysis, and multiattribute utility technology or MAUT (Hawthorne, 1987).

Benefit-Cost Analysis. Since this approach focuses on utility, benefit-cost analysis is usually the choice of "bottom line" decision-makers. As an economic evaluation of proposed or actual alternative options, cost-benefit analysis identifies and measures benefits and costs using an explicit decision criterion to decide the fate of an option (Hawthorne, 1987). Specifically, "the basic aim of a benefit-cost analysis of a government program is to determine whether the benefits of a program outweigh its costs" (Gremlich, 1981). The inherent challenge is to quantify the values of program benefits to determine whether its benefits exceed its costs or, given comparable programs, which one gets the job done more economically (Gremlich, 1981).

Although literature addressing how to determine the value of benefits was scarce, much more information was available to assess the costs of a program. For example, Head provides a training cost model as a tool for making effective, cost-conscious decisions (Head, 1985).

In addition to the literature for determining program costs and the value of benefits, some authors discuss how to improve the cost-benefit ratios. Although many managers' first reactions tend to be cutting program costs, Rosenthal and Mezoff advocate maximizing the benefits including "intended" as well as unintended outcomes. The authors define these ceremonial effects (unintended outcomes) of programs as:

1. A motivator
2. Build confidence and self-esteem
3. Reduce stress
4. Improve working relationships
5. Help in role changes. (Rosenthal, 1980)

Regarding role changes, Rosenthal and Mezoff discuss Belasco and Trici's (1969) findings in which a training program met its objectives with only marginal success; however, the personnel were transformed from one role identity to another (Rosenthal, 1980). Thus, should this study determine marginal educational benefits (if any) of the EWI program, the transformation of an officer from another career field to the contracting/manufacturing career field (role) should certainly be a benefit. Finally, Rosenthal and Mezoff provide suggestions for maximizing the benefits before, during, and after training.

1. Interview participants to discuss work and training-related needs.

2. Design training to help the individual transition to the new role. (Rosenthal, 1980)

In addition, Hawthorne mentions that sophisticated techniques have been developed for assessing the impact of risk and uncertainty for evaluating potential or proposed projects (Hawthorne, 1987).

Decision Analysis. This approach focuses on the ways data can assist in making decisions about programs or projects. Thus, this conceptual framework helps the managers translate findings into action. Hawthorne discusses Thompson's decision analysis evaluation model which identifies four components of the process: evaluation decision, evaluation result, program decision, and program result (Hawthorne, 1987). In this model, the decision-makers choose whether or not to evaluate and what to evaluate in the evaluation decision phase, while choosing what kind of program to develop in the program decision phase. Since the decision-makers have the choice of what to evaluate, they can also structure the extent of the evaluation by specifying the attributes of interest. For example, in using MAUT, the decision-makers (stakeholders) identify the program's goals, rank them according to importance, and weight them according to the stakeholders' own priorities. Subsequently, the individually-weighted attributes or objectives are converted to a common scale so they can be aggregated into a single figure. These aggregate values are then used to evaluate decision alternatives (Hawthorne, 1987).

Program Evaluation. Essentially, program evaluation is used to assess the worth of a program; however, the term is used in two ways in the literature. One definition encompasses all the efforts to systematically evaluate the impact or value of a program, policy, or

project. In this context, program evaluation is comparable to the concept of evaluation research. In the second sense, program evaluation refers to assessing the impact a program has on one or more objectives (Hawthorne, 1987).

Impact Evaluation. Given these uses of program evaluation, this study will use the impact evaluation approach of program evaluation since the focus of this method is to assess the impact of a treatment on specified outcomes or objectives (Hawthorne, 1987; Mohr, 1988).

Process Evaluation. Process evaluation, also implementation evaluation, investigates whether or not a program was implemented; the comparison of the planned program to the actual program implemented; and the extent of success of the various program activities. Alternately, impact evaluation assesses the change resulting from a policy or program. Thus, impact evaluation can also examine or evaluate a process as well as assess an entity's impact (Hawthorne, 1987).

The difference between impact analysis and process analysis is that impact analysis only provides the decision-makers with the rationale to continue or terminate a program and may not provide the information necessary to make any improvements in either outcome. Conversely, the process analysis is capable of providing ways for program improvements and is frequently used to assess how certain activities impact related outcomes (Hawthorne, 1987).

Outcome Line. Mohr's outcome line provides a systematic approach which links an activity with outcomes and the extent of the outcome and how it occurred. Such information can be extremely useful

to the decision-makers for planning improvements to a program and explaining the outcomes of those modifications (Mohr, 1988).

The essence of the outcome line is that it helps the evaluator select the goals or objectives that are the basis for the evaluation. This facet allows the evaluators to select a manageable number of clear and measurable program goals (Mohr, 1988). However, Hawthorne mentions Scriven's concern for the impact of unintended outcomes which may be as significant as the stated, intended program goals (Hawthorne, 1987).

Research Design. Although there is a wide range of research designs available within the area of impact evaluation, all such designs must compare the impact of the program with the state of the world lacking the program, or the counterfactual (Mohr, 1988).

Quantitatively identifying the counterfactual can be accomplished in two ways: using a comparison or control group, or pretesting the treatment group. In using a comparison or control group, the group's composition must be similar to the treatment group as much as possible otherwise an evaluation might attribute the outcomes to external events rather than to the program. By pretesting the treatment group, the counterfactual is defined by the pretest state measured. This pretest, posttest design may introduce other external influences between the two tests which may cloud the outcome issue. In either counterfactual method, the design goal is to attribute the outcomes unconditionally to the program (Mohr, 1988).

Lastly, the literature indicated that all impact evaluation designs have been used to study programs already implemented, thus requiring real-world data versus estimates on results (Hawthorne, 1987).

Internal Validity. According to Mohr, selection does affect comparison group design, and is thus a threat to internal validity. In using the diagrammed R-comparative-posttest design, the researcher must become concerned with divergent, extraneous events. Since the counterfactual of the study is based on the comparison group, some subjects may even improve without the treatment while others may very likely be helped by it (Mohr, 1988). This selection bias can be minimized if subjects are randomly assigned to experimental and control groups; however, the equivalence of the groups can be enhanced by matching the group members on key factors such as specialty code, years of commissioned service, and type of current job (Emory, 1985).

External Validity. Although the outcomes can be unconditionally attributed to the program, the impact analysis design must be able to provide results that can be generalized to different applications, i.e., different age groups, career fields. The previous discussion only concerned internal validity by determining the extent of causality between the program and the outcome; however, there is a scarcity of impact evaluation literature on generalizability or external validity (Hawthorne, 1987).

Additionally, the setting of the treatment (education) may be important. Since EWI students work for different private companies in many different industries, the students' experiences may differ due to variances in the treatment. In fact it is difficult to assess the precise nature of the education due to the treatment occurring at many different sites in addition to the self-education nature of the program mentioned earlier. Thus, it would be difficult at best to predict

whether a replication of the treatment would produce the same results for any two individuals at the same host company (Mohr, 1988).

In addition to using statistical significance for guiding decision-making once the data are collected, Mohr discusses the rarely applied effectiveness and adequacy ratios. These decision rules also compare the measured outcomes to the counterfactual, either a control group or a minimal estimated state of the world without the program (Mohr, 1988).

Limitations. The literature also presented some limitations of evaluations. Typically, evaluation consists of obtaining feedback from the participants at the end of the program. This situation frequently occurs due to the unavailability of a better evaluation method (Sweetland, 1978). Furthermore, Sweetland summarizes Thorley's viewpoint concerning the evaluation of management development programs: "opinion surveys are virtually useless since they're usually post-test only and subject to cognitive dissonance and demand characteristics" (Sweetland, 1978).

Difficulties. Barring a lack of initiative or interest on behalf of the human resources development profession, why is it unusual to find systematic, integrated, and comprehensive evaluations of development programs? Tracey believes this situation is partly due to the immensity and difficulty of the evaluation tasks, but more importantly, there is a lack of ordered and valid appraisal standards (Tracey, 1968). He also discusses three other problems: staffing the project, the diversity of management development programs and the resistance to evaluation by faculty or staff (Tracey, 1968).

Success. Given the above limitations and difficulties, Tracey provides three critical items for ensuring the success of program evaluations.

1. Top-level support
2. Skilled leadership
3. Total involvement (Tracey, 1968)

With the presence of these items, the evaluation will obtain the required resources and the commitment of the staff as well as the program participants to ensure successful results.

Benefits. From the viewpoint of the organization and the development program participants, there appear to be important benefits and uses of program evaluations. Rosenberg (1987) provides six reasons why the benefits of good program evaluations heavily outweigh the costs.

1. They can remove the fear of evaluation. This fear is sometimes caused by poor evaluations perceived as a criticism of performance or an omen to future punishment.
2. They can teach about evaluation. Good, successful evaluations of programs can help diminish the above negative perceptions, if not entirely dispel them. Furthermore, successful evaluations can serve as models for future evaluation efforts hopefully convincing more managers of the worth of good evaluations. Subsequently, those managers may be more likely to use evaluation techniques in the future.
3. They can generate support for a program. Good evaluations can clearly show the effect of management development programs by explaining its contribution to organizational goals. As a result, effective program evaluations can lead to top-level management support and increased financial backing.
4. They can bring a program into focus. By documenting the strengths and weaknesses of management development programs, formative evaluation techniques can provide ways to improve the program.

5. If an individual improves performance through a management development program and good evaluations can improve the program, it follows that good evaluations techniques can provide important feedback to improve an organization's overall performance, too.

6. They contribute to the "bottom line". Performed correctly, good evaluations save time and money through improved, more effective performance by individuals and their organizations. Thus, evaluations can reduce waste and alert management of approaching big problems before they occur (Rosenberg, 1987)

Good evaluations can also prove useful to managers in matters regarding program funding, nature or operation of the program, or management of a program (Tracey, 1968; Cousins & Leithwood, 1986). By conducting successful evaluations and obtaining meaningful and accurate information, HRD managers are better able to defend their activities and thus enjoy continued top-level management support and necessary funding. Secondly, evaluation allows the HRD managers to determine the efficiency, effectiveness, and utility of the management and operation of the development effort by satisfying management's information needs (Cousins & Leithwood, 1986). Finally, a formative evaluation serves as a beginning point in the overall process of program improvement (Tracey, 1968).

Critique of Previous Studies

Ingols' examination (1987) of case studies of the evaluations of management education programs revealed four major issues. One issue, Ingols claimed, was that evaluation of programs has not kept pace with the growing number of programs and the money spent on them. In essence, the number of programs evaluated has grown proportionally smaller. More importantly, there appears to be minimal cross-referencing among evaluation authors, suggesting that the evaluators are unaware of

results and methodologies previously used (Ingols, 1987). According to Ingols (1987), this observation is especially true among authors reporting results of in-house, organization-specific management education programs. This condition could lead to redundant activity rather than reproducing and testing the methodologies of previous studies (Ingols, 1987).

Another critique of past evaluation studies concerned four major reviews of published studies of management education programs. These reviews primarily focused on the methodology used rather than on the findings of the studies. Consequently, Ingols asserts the reader learns more about appropriate evaluation techniques, but very little about the impact of management development programs on the participants (Ingols, 1987).

Finally, Ingols claims the evaluators rarely use theoretical constructs such as personal development and Whitehead's educational stages to guide evaluation research. Consequently, the authors do not attempt to interpret the evaluation results in a broader theoretical context (Ingols, 1987).

Summary

This chapter has provided a conceptual framework for the EWI program as a management education program within the management development subsystem of the overall organizational development system. Additionally, the discussion provided a brief history of management development activities, trends in the 1980s, and a review of the corporate education model. Finally, the chapter presented the concept of program evaluation. Some topics covered included the purpose of

evaluation, a review of three evaluation methods, some limitations and difficulties of evaluation, the necessary items for evaluation success, some benefits and uses of good evaluations, and a critique of previous evaluations of management education programs and a discussion of related issues resulting benefits. Chapter III will discuss the methodology for the research study.

III. Research Design and Methodology

Introduction

This chapter describes the specific research methodology and procedures to test the proposed research hypotheses and the overall management question discussed in the first chapter. The discussion includes the following sections: Research Design, Method of Data Collection, Sample Population, The Measurement Instrument, Data Collection, Data Analysis, and Assumptions.

Research Design

This formal, descriptive study used an ex post facto, cross-sectional design to examine the benefits of Air Force officers in the contracting/manufacturing career field (65XX) participating in the EWI program. This statistical, field study included factors which were predicted to impact the level of benefits:

1. Officer job satisfaction
2. Self-rated ability
3. Self-rated level of effort
4. Intent to remain in the Air Force for at least 20 years
5. Job involvement
6. Organizational commitment
7. Supervisor's feedback on officer performance
8. Goal agreement between the officer and his/her organization

The research design will use a retrospective viewpoint to conduct a summative evaluation. The summative evaluation will assess the added

value or merit of the EWI program thus focusing on its impact upon contracting officers/manufacturing managers and perhaps the Air Force.

Method of Data Collection

Since the data required for this study was not available from a known source, the researcher was required to collect primary data. Although several data collection methods were available, the researcher decided a survey research technique was the most appropriate method. The population size coupled with time and financial constraints were three reasons for using a mail survey to collect data from Air Force officers previously or currently in the contracting/manufacturing career field.

One advantage of using a mail survey to collect this data was its lower administration cost compared to observation, experimentation, or interview techniques. Other advantages included a wider dissemination of the survey allowing more accessibility to a larger population, more time for the respondents to complete the survey, and a greater perception of anonymity by the respondent. Conversely, this data collection method has at least two inherent shortcomings - a less than 100 percent response rate and inaccurate data due to misinterpreting the question(s), insufficient knowledge regarding the subject matter, or improperly marking the answer sheet. Since AFIT surveys generally obtain a usable response rate, a large enough population could be determined for the survey to ensure meaningful statistical analysis. Additionally, the respondents were expected to have adequate knowledge regarding the subject matter since the survey concerned their personal attitudes and self-perceptions.

Validity. Content validity was established through a rational analysis of the content of the survey. This determination was based on individual, subjective judgments concluding the survey measured the relevant variables. To increase the content validity of the survey (Appendix A), the researcher conducted a pilot study of the survey using the six contract management officers listed in Appendix B. These officers provided feedback on the relevancy, clarity, and representativeness of the survey items. As a result of the pilot study, the questionnaire could obtain more useful and accurate data from the survey participants.

Sample Population

As mentioned earlier, this study focused on the population of Air Force officers in the contracting/manufacturing career field (65XX) with specific interest in two groups: a treatment and a comparison. The treatment group consisted of contracting/manufacturing officers who were graduates of the 1983 through 1987 EWI programs. In this respect, the survey approximated a census since the researcher mailed surveys to all of the available graduates (N=259).

Alternately, the comparison group consisted of a random sample of the remaining Air Force contracting/manufacturing officers currently assigned to central/systems positions. Generally, contracting/manufacturing personnel in central/systems positions support weapon systems acquisition activities within a DOD R&D or logistics support organization. Typically, these organizations include Air Force Systems Command, Logistics Command, Headquarters Air Force, or other contract administration organizations. In addition to being assigned to

central/systems positions, the contracting/manufacturing officers in the comparison group were also required to have between four and sixteen years of commissioned service to closely resemble the composition of the EWI or treatment group.

The total population of the contracting/manufacturing career field consists of approximately 1400 officers ranging in rank from first lieutenant to colonel. Slightly less than half, or 700, are assigned to central/systems positions which is a criterion of the study. Of this population of 700, the research drew a sample (N=259). Since the required sample size for a 90 percent confidence level was calculated to be N=68, the study's sample should be representative of the total population, thereby allowing generalization of the research findings to the 65XX officers in central/systems positions (see Appendix C). The Air Force Military Personnel Center at Randolph Air Force Base, San Antonio, Texas, provided the names and addresses of the randomly selected officers comprising the comparison group through the use of the Atlas database. Meanwhile the EWI program manager, Lt Col Mary Mayer, provided the roster of EWI graduates for the class years mentioned.

The Measurement Instrument

To collect the necessary data, the researcher developed a questionnaire. The instrument was based on previous AFIT attitude surveys as well as other areas of interest suggested by the literature review. Additional questions were specified by the EWI program manager. The survey contained three parts: Part I items were to be answered by everyone who received the survey; Parts II and III included questions that were specific to the EWI contracting and manufacturing graduates.

Part I. All respondents were asked to answer this set of 58 questions that were arranged into eight sections. After completing this set of questions, officers not attending EWI were asked to stop and mail in their questionnaires and answer sheets. Meanwhile, officers attending EWI under the manufacturing management option (652X) were asked to continue the survey by answering the questions in Part II. Alternately, officers attending EWI under the contracting option (653X) were asked to continue the survey by answering the questions in Part III. The following narrative describes the sections contained in Part I.

Background Information. This section contained 15 demographic items requesting personal background information. Table 1 lists the variables measured in Part I.

Job Satisfaction. This section contained a 5-item measure adapted directly from the AFIT Survey of Work Attitudes (Crow, 1987). To parallel the other work attitude scales in this questionnaire, the scoring was reversed on each of the five items in this measure (Crow, 1987). This measure is scored on a 7-point Likert scale ranging from "delighted" at the low end, through "mixed" at the midpoint, to "very unhappy" at the high end.

Supervisor's Feedback of Performance. This section contains a 5-item measure of the respondent's perception of his/her supervisor's assessment of the respondent's performance. This measure references the shared feedback between the supervisor and the subordinate concerning the subordinate's efficiency and effectiveness on the job (Steel and Ovalle, 1984). The measure is scored on a 7-point Likert scale ranging

Table 1. Variable Descriptions of Survey Items

VARIABLE	SURVEY ITEM NUMBER
Age	1
Education Level	2
Sex	3
Marital Status	4
Time in Current Job	5
Rated Supplement Status	6
Rank	7
Length of Military Service	8
Length of Prior Enlisted Service	9
Source of Air Force Commission	10
Current Air Force Specialty Code	11
Years of Experience in Current Specialty	12
Amount of Air Force Contract/ Manufacturing Management Training (In Weeks)	13
Participation in the EWI Program	14
Intent to Remain in the Air Force for 20 Years	15
Job Satisfaction	16-20
Supervisor's Feedback on Respondent's Performance	21-25
Self-rated Job Effort	26
Unit Commitment	27-41
Job Involvement	42-56
Goal Agreement	57
Self-perceived Ability	58

from "far worse" at the low end, through "about average" at the midpoint, to "far better" at the high end.

Job Effort Rating. This single-item measure requests a fair and objective self-assessment of the individual respondent's perception of the normal level of effort that s/he puts into doing his/her work (Crow, 1987). The measure is scored on a 5-point Likert scale ranging from "very little effort" at the low end, through "moderate effort" at the midpoint, to "very much effort" at the high end.

Unit Commitment. This scale was taken directly from the ASWA and originated from the Organizational Commitment Questionnaire (Mowday et al, 1979). The measure determines how individuals feel about the organization for which they work (Crow, 1987). This 15-item measure is scored on a 7-point Likert scale ranging from "strongly disagree" at the low end, through "neither agree or disagree" at the midpoint, to "strongly agree" at the high end. The third, seventh, ninth, eleventh, twelfth, and fifteenth items are reversed scored.

Job Information. These three 5-item scales measure the level of the respondent's involvement with his/her job or work (Saleh & Hosek, 1976). The first five items measure the respondent's participation in work (Crow, 1987). The next five items measure the respondent's central life interest (Crow, 1987). The twelfth through fourteenth items measure the respondent's self-concept (Crow, 1987). All items in the three measures are scored on a 7-point Likert scale ranging from "strongly disagree" at the low end, through "neither agree or disagree" at the midpoint, to "strongly agree" at the high end.

Goal Agreement. This single item measures the respondent's perception concerning the compatibility between his/her personal goals and the goals of the organization for which she/he works (Crow, 1987). This measure is scored on a 7-point Likert scale ranging from "not at all" at the low end, through "moderate" at the midpoint, to "very great" at the high end.

Self-Perceived Ability. This measure describes the respondent's perception of his/her ability to perform the work compared to others doing similar work (Crow, 1987). This item is scored using a 5-point Likert scale ranging from "much less" at the low end, through "same" at the midpoint, to "much more" at the high end.

Intent to Remain. This single item measures the respondent's intention to remain in the Air Force for at least 20 years (Crow, 1987). The possible responses indicate the respondent is definitely not staying, probably not staying, leaning toward not staying, undecided, leaning toward staying, probably staying, definitely staying, or not applicable, already completed 20 years of service.

Part II. After completing Part I, only officers who attended EWI in the manufacturing management option (652X) were asked to answer this set of questions focusing on manufacturing training and experience. Meanwhile, the officers attending EWI in the contracting option (653X) were instructed to skip Part II and go directly to Part III. The respondents were asked to return the questionnaire and answer sheet after completing this portion of the survey.

Education With Industry. The first four items requested information regarding the respondent's career experience prior to

attending EWI, the year of graduation from EWI, and the total number of Air Force manufacturing management training courses attended during his/her career.

EWI Education. This set of ten items asked the respondents to indicate their opinions regarding the type of education received during the EWI tour, the extent of its importance for the officer's job performance, and whether or not this private industry experience was available through Air Force management training courses. These 10 items were scored using a 7-point Likert scale ranging from "strongly disagree" at the low end, through "neither agree or disagree" at the midpoint, to "strongly agree" at the high end. The fourth and sixth items were reverse scored.

EWI Program. These final five items requested information regarding the respondent's EWI experience. The first two items asked the EWI graduate to rate the support provided by the program manager and the staff during their tour. These two items were scored using a 7-point Likert scale ranging from "nonexistent" at the low end, through "adequate" at the midpoint, to "excellent" at the high end.

Additionally, the graduates were asked to recommend the amount of EWI orientation needed based on the amount of orientation they received. This item was scored using a 7-point Likert scale ranging from "much less" at the low end, through "the same" at the midpoint, to "much more" at the high end.

Based on their personal experiences, the EWI graduates were asked to recommend the amount of manufacturing management experience an EWI student should have prior to attending EWI. This item was scored using

a 7-point Likert scale ranging from "none" at the low end, through "18 months" at the midpoint, to "31 months or more" at the high end.

Finally, the graduates were asked to rate their overall EWI education experience. This item was scored using a 7-point Likert scale ranging from "very bad" at the low end, through "neutral" at the midpoint, to "extremely positive" at the high end.

Part III. This section of the survey was identical to Part II, except the questions were specifically worded for the officers attending EWI under the contracting option (653X). Only contracting officers were to answer these questions about their contracting experience and training. Just as for the manufacturing students with Part II, the respondents were asked to return the questionnaire and the answer sheet after completing this portion of the survey.

Survey Validity. To enhance the internal validity of the measurement instrument, the researcher administered the survey to the six contract management officers listed in Appendix B. This pretest group included three EWI graduates. Each respondent was interviewed after completing the survey to clarify any questions regarding the survey and to obtain valuable feedback for improving the instrument. The researcher then incorporated these comments into the final version of the survey.

External validity was enhanced by careful selection of the sample population. The comparison group was selected to approximate the treatment group (EWI) with respect to years in service, similar proportion of contracting and manufacturing specialties, and type of position (central/system). Furthermore, the sample population appeared

to be representative of the total population of the contracting/manufacturing career field. This characteristic allowed generalization of the results for the entire population of contracting/manufacturing officers in central/systems positions; however, no generalizations should be made for contracting/manufacturing officers in non-central/systems positions or for officers outside the 65XX specialty.

Data Collection

The survey package consisted of a cover letter that stated the purpose of the research and requested the participation of the addressee, one questionnaire, one optical-scan answer sheet, and one self-addressed return envelope to the researcher. Four weeks were allowed for an adequate number of return responses before beginning analyses of the data. As the responses were received, the optical-scan answer sheets were numbered for case identification and checked for stray marks, incomplete erasures, errors, and general condition. After the preliminary quality check and corrections (if needed), the optical-scan forms were submitted to the computer center to be read into the researcher's database by the optical-scan equipment. The data were optically read and then loaded into a computer database. The researcher obtained a printed tabulation of the database to visually inspect the data for missing values. Each missing value was cross-checked with its respective answer sheet to obtain those values caused by mechanical error of the optical scanning machine. The researcher then manually edited the original database to include these missing values.

Data Analysis

The statistical analysis for the research was performed using the Statistical Package for Social Sciences, update 10 (SPSS-X). The statistical analysis software resides on a VAX 11/785 computer. The following discussion describes the data analysis procedures.

Frequencies. This procedure performed a frequency count for the various responses to each individual item and calculated the valid percentages for each possible response of an item as well as cumulative percentages. Additionally, the program provided a histogram accompanied with the respective descriptive statistics such as the mean, mode and median, standard deviation, variance, minimum and maximum values, and the number of valid cases. Finally, this procedure helped identify missing and out-of-range values. Although the frequency portion provided the number of missing values for the responses to a particular item, these values were excluded in the percentage and histogram calculations.

Pearson Correlation. Following the frequency procedure, several item variables were selected for computing a correlation matrix using the Pearson correlation subroutine. The resulting correlation matrix presented the coefficient of correlation between any two variables and the associated p-value describing the significance of the particular correlation (see Appendix E, Table 31).

T-Test. After reviewing the correlation between the above variables, the data were sorted into two groups: the treatment group consisting of contracting/manufacturing officers having attended EWI while the comparison group consisted of 65XX officers not having

attended EWI. Subsequently, the means of the above item variables were tested for statistical significance. The findings were considered statistically significant if $p < 0.05$.

Reliability. The SPSS-X reliability function computed the coefficient alphas for the composite measures presented below in Table 2. The alpha coefficient indicates the extent a measure supplies consistent results due to a lack of random or unstable error (Emory, 1985). Thus, a variable having a value of 0.7 or greater would indicate a relatively stable measure capable of obtaining consistent results. The alphas in the tables are the coefficient alphas described by Cronbach.

Variance Analysis. An analysis of variance was then conducted for variables representing potential benefits to the Air Force from EWI attendees. The data was again sorted into two groups: group one consisted of officers who attended EWI; group two consisted of the officers who did not attend EWI. Using the SPSS-X oneway function with a Tukey procedure at an 0.05 significance level, several independent variables had significant differences in their relationship to dependent variables, i.e., various categories within the independent variables differed significantly in their effect on the dependent variables. These results will be discussed in Chapter IV.

Regression. Multiple regression analyses were also performed to determine the relationships of the independent variables to the dependent variables. The results are discussed in Chapter IV, Table 7.

Table 2. Reliability Analysis of Composite Scores

Variable Label	Reliability Coefficient (alpha)
Supervisor's feedback	.91
Job involvement	.85
Participation in work	.85
Central life interest	.92
Self-concept	.68
Job satisfaction	.80
Organizational commitment	.88

Assumptions

The following assumptions were made in conducting the research:

1. Linearity of data.
2. Interval measurement scales.
3. Homogeneity of variances.
4. EWI attendees only differed from non-EWI attendees due to the EWI treatment (same population).

Limitations

Possible limitations of this study evolved from the specific parameters and focus of the research design. External validity may have possibly been affected due to the characteristics of the treatment and comparison groups used in the study. Another possible limitation was the representativeness of the comparison group to the total population. This sample did not appear to contain a similar proportion of lieutenant colonels. The return rate of the comparison group and the characteristics of those respondents may have adversely affected the characteristics of the research data.

In summary, this chapter described the specific research methodology and procedures to test the various hypotheses. The discussion included a description of the descriptive study's ex post facto cross-sectional design to examine the impact of contracting/manufacturing officers participating in the EWI program. In addition, the discussion described the data collection via a mail survey which was mailed to EWI graduates and non-EWI attendees for comparison purposes. The narrative also described the variables of interest contained in the measurement instrument, the reliability of composite variables, and the

pilot study to performed to enhance the internal validity of the survey instrument. The data collection and analysis procedures were described as well as the research assumptions and limitations. Chapter IV presents the results of the analysis efforts and a discussion of the results as well as recommendations for future study.

IV. Results, Discussion, and Recommendations

Introduction

The intent of this study was to determine the value of the EWI program by focusing on added value or benefits to the EWI participants and subsequently to the Air Force. The study investigated potential benefits from variables such as the intent to remain in the Air Force for 20 years, attitudes regarding work, and self-rated job performance. The major research questions included: What is the relationship between an officer attending EWI and his/her intent to remain in the Air Force for 20 years? Do officers attending EWI exhibit more positive attitudes regarding their work than officers not attending EWI? How does an EWI graduate's self-rated performance compare to his/her contemporaries who did not attend EWI? How do EWI graduates view their experience with private industry?

This chapter first introduces the general demographics followed by the results of testing the relationships described in the proposed hypotheses. Subsequently, the combined findings from the EWI sections (Parts II and III) are presented. Finally, the discussion will provide recommendations regarding the EWI program.

Description of the Population and Sample

The subjects of this study were Air Force officers in the 65XX specialty (contracting/manufacturing). Consequently, surveys were mailed to a randomly selected comparison group consisting of contracting and manufacturing officers and to the officers graduating from the EWI contracting/manufacturing options between 1983 and 1987.

The comparison group subjects were in either central or systems level assignments (i.e., Air Force Systems Command, Air Force Logistics Command, Hq USAF, or contract administration organizations) and had between four and sixteen years of commissioned service. All returned responses were usable in the study. Table 3 presents the response rates.

Sample Demographics. The typical survey respondent was a married male between 31 and 35 years of age with a Master's degree. Additionally, the respondent was a non-rated captain with 10 years or more of military service (no prior enlisted service) and he had received his commission through the Reserve Officers Training Corps program. The respondent's current duty AFSC was 653X, a contracting officer, and he had less than seven years of experience in the specialty. Furthermore, this contracting officer had received over 20 weeks of Air Force contracting/manufacturing specialty training and had been in his current job between 12 and 18 months. Finally, this officer definitely intended to remain in the Air Force for at least 20 years (see Table 4 and refer to Appendix D for frequency tables).

The next section of this chapter presents the findings of the tests of hypotheses proposed in Chapter I.

Hypothesis 1

Hypothesis 1 states: Contracting/manufacturing officers participating in EWI exhibit a higher degree of intent to remain in the Air Force than contracting/manufacturing officers who have not attended EWI.

Table 3. Survey Response Rates

Overall (N=518)	EWI (N=259)	Non-EWI (N=259)
57% (n=278)	63% (n=163)	44% (n=115)

Table 4. Description of Typical Survey Respondent

Age	31 - 35 years
Education	Master's degree
Sex	Male
Marital Status	Married
Time in Job	12 -18 months
Rated Supplement Status	No
Rank	Captain
Length of Military Service	10 years or more
Length of Enlisted Service	None
Source of Commission	ROTC
Current Duty AFSC	653X (Contracting)
Years Experience in Current AFSC	Less than seven
Amount of Air Force 65XX Training	20 weeks or more
EWI Attendee	Yes
Intent to Remain in Air Force	Definitely

A t-test analysis failed to confirm this hypothesis. Although the mean for the treatment group (EWI) was greater than the mean for the comparison group (non-EWI), the difference of the means was not significant (see Table 5).

The t-test of the overall measure of the intent to remain between the treatment and comparison groups failed to confirm different populations; however, more in-depth analysis provided useful information. The data were sorted based on the number of years of total military service, and t-tests were again conducted. Although the results were still not significant, Table 6 presents some interesting information. For example, the category "6 years but less than 7 years" shows the EWI group's intent to remain to be higher than the non-EWI group. Perhaps this phenomena is partly due to the officers normally participating in EWI at their careers' six to seven year point (see Appendix F). It is assumed if an officer is selected for EWI, that s/he will remain in the Air Force for approximately three and a half more years (10 months for EWI and then 30 more months active duty service commitment). Accordingly, Table 6 shows that the EWI mean for intent at the "9 years but less than 10 years" category drops below the mean of the previous category ("8 years but less than 9 years").

Further investigation using the SPSS oneway variance analysis function also failed to confirm significant differences between EWI and non-EWI subjects with respect to their intent to remain in the Air Force for 20 years. However, the oneway variance analysis did provide some insight to other relationships.

Table 5. T-test Results for Hypothesis 1

Variable	Number of Cases	Mean	Standard Deviation	T Value	D.F.	2-Tail Prob
Intent to Remain						
EWI	163	6.29	1.28	1.31	275	0.19
Non-EWI	115	6.08	1.45			

Table 6. Group Comparison of Intent to Remain by Length of Service

SERVICE	EWI	NON-EWI
4 years to less than 5	-	4.5
5 years to less than 6	3.0	5.0
6 years to less than 7	6.2	5.5
7 years to less than 8	5.7	4.3
8 years to less than 9	5.8	6.0
9 years to less than 10	5.4	6.1
10 years or more	6.7	6.7

This analysis showed that a contracting/manufacturing officer's intent to remain in the Air Force for 20 years was significantly affected by length of military service, AFSC, years of experience in the contracting/manufacturing career field, amount of training received, and age (see Table 7). These findings seem reasonable since all of these variables vary as a function of time. Thus, the longer an officer remains in military service, the older he/she becomes and the greater the opportunities for training. Similarly, a longer period of military service in the 65XX career field would lead to more experience in the contracting/manufacturing specialty and could likely lead to a staff position (651X AFSC).

In conjunction with variance analysis, the researcher conducted correlation analysis. This analysis revealed that the treatment variable, EWI, and intent to remain in the Air Force for 20 years were negatively correlated (see Appendix E, Table 31). This information implies that a contracting/manufacturing officer who attends EWI is less likely to intend remaining in the Air Force for 20 years than a contracting/manufacturing officer who does not attend EWI. Conversely, the analysis showed intent to remain had significant positive correlations with other variables, namely: length of military service, amount of training received, job involvement, job satisfaction, organizational commitment, and goal agreement. Furthermore, the length of service was shown to be positively correlated at a significant level to AFSC (651X), years of experience in the 65XX career field, and the amount of contracting/manufacturing training received. These findings seem reasonable since one could expect an officer with relatively more

Table 7. Variance Analysis for Intent to Remain

Variable	D.F.	F	F Prob
AFSC	3	8.60	.000
Service	7	16.53	.000
Years Experience	6	3.11	.005
Training	6	3.59	.001
Age	4	18.24	.000

years of military service (10 or so) to be in a staff position (651X AFSC), to have about seven years of 65XX experience, and to have received more than 20 weeks of 65XX training (see Table 4).

After conducting these statistical analyses, the researcher conducted a regression analysis for the dependent variable, intent to remain in the Air Force for 20 years (see Table 8). The independent variables having significant F-values in this model were service, training, AFSC, and age. The standardized betas indicate service was the independent variable having the greatest impact on explaining the variation in intent to remain in the Air Force for 20 years. Age and training had slightly less than two-thirds the explanatory power of length of service in this model. Meanwhile, AFSC, the fourth significant independent variable, had about one-third the explanatory power of length of service. Conversely, EWI did not have a significant impact on the dependent variable, intent to remain.

The analyses failed to confirm that a contracting/manufacturing officer who attends EWI has a greater intent to remain in the Air Force for 20 years than a contracting/manufacturing officer who did not attend EWI. In fact, the correlation analyses showed that an officer who attended EWI was less likely to remain in the Air Force for 20 year than an officer who did not attend EWI (Appendix E, Table 31). Finally, regression analyses showed that an officer's age, amount of training received, years of experience in the contracting/manufacturing career field, duty AFSC, and length of military service significantly affected an officer's intent to remain in the Air Force for 20 years, while EWI did not (see Table 7).

Table 8. Multiple Regression for Intent to Remain with Age, AFSC, EWI, Military Service, Training, and Years Experience

Dependent Variable: Intent to Remain
Independent Variables: Age, AFSC, EWI, Military Service, Training, and Years Experience

Multiple R	.5581	F = 20.3629
R Square	.3115	Signif F = .0000
Adjusted R Square	.2962	
Standard Error	1.1442	

Variables in Equation

Variables	B	SE B	Beta	F	Sig F
Service	.2647	.0534	.3391	24.583	.0000
Training	.1426	.0439	.1772	10.551	.0013
AFSC	.1956	.0904	.1147	4.681	.0314
Years Experience	-.0276	.0355	-.0468	.603	.4381
EWI	9.0784E-4	.1589	3.433E-4	.000	.9954
Age	.2833	.1003	.1869	7.956	.0051
(Constant)	1.7679	.5142		11.817	.0007

Hypothesis 2

Hypothesis 2 states: Contracting/manufacturing officers participating in EWI exhibit more positive attitudes regarding their work than do contracting/manufacturing officers who did not attend EWI.

The various analyses failed to confirm the hypothesis. To test this hypothesis, the researcher investigated the results of t-tests for the attitudinal measures: job satisfaction, organizational commitment, job involvement (i.e., participation in work, central life interest, and self-concept). In all cases, the t-tests showed no significant difference between those officers who attended EWI and those who did not (see Table 9). However, the t-test results showed the non-EWI group scored higher than the EWI group on the job satisfaction, organizational commitment, and the self-concept (job involvement) measures. Conversely, the EWI group scored higher than the non-EWI group on the goal agreement, self-rated effort, and participation in work and central life interest (job involvement) measures.

A oneway analysis of variance disclosed that there were some significant differences in levels of variance between the EWI and non-EWI groups. The analyses show that the job satisfaction measure was affected by the respondent's amount of training and AFSC (Table 10). Specifically, the respondents having received 16-20 weeks of training exhibited a higher level of job satisfaction than respondents having only 1-4 weeks of training. Alternately, the respondents having an AFSC of 651X (normally a major or lieutenant colonel staff position) exhibited a higher degree of job satisfaction than respondents having a 652X (manufacturing management) AFSC.

Table 9. T-test Results for Hypothesis 2

Variable	Number of Cases	Mean	Standard Deviation	T Value	D.F.	2-Tail Prob
Job Satisfaction						
EWI	163	5.01	0.94	-0.33	275	0.74
Non-EWI	115	5.05	1.02			
Organizational Commitment						
EWI	163	4.58	1.05	-0.34	274	0.73
Non-EWI	114	4.62	1.14			
Job Involvement (Participation in Work)						
EWI	163	5.05	1.34	0.84	275	0.40
Non-EWI	115	4.91	1.34			
Job Involvement (Central Life Interest)						
EWI	163	2.92	1.49	0.49	275	0.63
Non-EWI	115	2.83	1.37			
Job Involvement (Self-Concept)						
EWI	163	6.12	0.80	-1.32	275	0.19
Non-EWI	115	6.25	0.81			

Table 10. Variance Analysis for Job Satisfaction Measure

Variable	D.F.	F	F Prob
Training	6	2.62	.017
AFSC	3	2.61	.051

The analyses also showed that the job involvement measures were affected by the respondent's AFSC (Table 11). In this case, a respondent having a 651X (staff) AFSC exhibited a higher degree of job involvement than did the manufacturing (652X) and contracting (653X) officers.

Hypothesis 3

Hypothesis 3 states: A majority of contracting/manufacturing officers graduating from EWI receive unique private industry education and knowledge.

To test this hypothesis, the researcher investigated the mean responses for items 66 and 68 (see Appendix F). These questions asked the EWI respondents to indicate whether other Air Force training (besides EWI) had provided better knowledge about private industry's manufacturing/contracting process and business environment. In both instances, the EWI graduates indicated at least significant agreement that EWI provided unique private industry education and knowledge (83 percent and 78 percent, respectively). Additional analysis was conducted using analysis of variance and correlation procedures to examine the relationships between supervisor's feedback and ability, and EWI. Neither procedure provided significant findings concerning these relationships. The test of this hypothesis confirmed a majority of contracting/manufacturing officers graduating from EWI did receive unique private industry education and knowledge.

Table 11. Variance Analysis for Job Involvement Measure

Variable	D.F.	F	F Prob
AFSC	3	4.92	.002

Hypothesis 4

Hypothesis 4 states: A majority of EWI graduates view their private industry education as an overall positive experience.

A frequency analysis showed that 92 percent of the EWI respondents viewed their EWI experience positively with an overall 60 percent of the respondents viewing their EWI experience as extremely positive (see Appendix F). This analysis confirms that a majority of EWI graduates view their private industry education as an overall positive experience.

Summary

Hypotheses 1 and 2 stated that EWI would have a significant effect on a contracting/manufacturing officer's intent to remain in the Air Force and positive work attitudes. The various analyses failed to confirm either hypothesis. Hypotheses 3 stated EWI provided contracting/manufacturing officers a unique educational experience while hypothesis 4 stated that the EWI officers viewed their EWI education as a positive experience. The analyses confirmed both of these hypotheses.

Discussion

As length of service, years experience and age increase, it seems reasonable to assume an officer would receive more specialty training and progress toward a staff position (651X AFSC). Also, Ivancevich and Matteson (1987) state that a reward system based on merit should encourage the better performers to remain with the organization. Thus, if the officers perceive training and increased responsibility (651X AFSC) as intrinsic and extrinsic rewards, then they would be expected to remain in the Air Force. This research investigated an officer's

intent to remain in the Air Force for 20 years; however, an officer could remain in the Air Force and yet not remain in the same work organization or the same career field (duty AFSC). Since the Air Force seems concerned about the retention rate of contracting/manufacturing officers, this observation is a point of interest worthy of future investigation. Furthermore, both the EWI and non-EWI groups reported a higher intent to remain at the 10 or more year career point. This occurrence seems plausible since an officer about half way to retirement eligibility would be expected to have a higher intent to remain than a more junior officer.

Meanwhile, variance analyses were used to investigate intent to remain as a function of military service, AFSC, years experience, and amount of training. These relationships were of interest because an officer with more years of military service will eventually obtain a 651X AFSC (major or lieutenant colonel staff position), the number of years of experience will also increase, as will the amount of training received. So in essence, this research identified other factors besides EWI that were more likely to contribute to an officer's intent to remain in the Air Force for 20 years.

The investigation about the relationship between EWI and more positive work attitudes also failed to confirm that EWI was a significant factor. The higher scores for the EWI group in goal agreement, self-rated effort, and participation in work and central life interest seem to indicate a highly motivated and dedicated EWI officer. What is significant is that although the EWI officers appear to be highly dedicated and motivated people, their lower score in the self-

concept measure of job involvement implies EWI officers do not live or die with their job, certainly a beneficial and healthy mental attitude.

Variance analysis showed that job satisfaction was affected by the amount of training and the AFSC. The amount of training appears a reasonable influence on job satisfaction since a better trained officer could encounter more opportunities for promotion and thus be more satisfied (Ivancevich and Matteson, 1987; Lusteran, 1977). The AFSC (651X) should also influence job satisfaction since an officer with that AFSC is generally older and has more experience. Ivancevich and Matteson (1987) define job satisfaction as a discrepancy between what or how much a person expects from the job and what is actually received. As an officer ages and matures, the officer could simply adjust his/her job expectations to a more realistic level, thus lowering the discrepancy and resulting in a higher degree of job satisfaction (Ivancevich and Matteson, 1987). Similarly, an officer's work experience could lead to more responsibility and a more challenging job, again increasing job satisfaction.

The lower job satisfaction score for the EWI group could be due to unfulfilled expectations (Ivancevich and Matteson, 1987). The EWI graduates may believe their private industry experience provides them with greater management insight and ability. Consequently, the EWI graduates may believe they have a greater capacity for handling more responsibility than officers who did not attend EWI, and thus the EWI graduates may expect a greater share of responsibility. When the EWI officers are not given this greater share of responsibility, their expectations for greater responsibility are unfulfilled. Additionally,

this lower job satisfaction score for the EWI officers may be due to unfulfilled expectations of authority. Similarly, the EWI graduates may believe they have a greater capacity for handling more authority than officers who did not attend EWI. Thus, EWI officers may expect a greater share of authority. When EWI officers are not given this greater share of authority, their expectations are unfulfilled. In both cases, job satisfaction may suffer (Ivancevich and Matteson, 1987).

These assertions are further supported by data analysis for training and the EWI experience (item 69). First, the comparison group differed (at a significant level) from the EWI group for the amount of training received. This four to eight week difference in training may be due to the EWI officers having less opportunity to receive additional specialty training after attending the 10-month EWI program. Conversely, this difference could be a result of the EWI officers perceiving their 10-month private industry education as an "edge" over non-EWI contracting officers, regardless of the amount of training they have received.

Since the two groups only varied by a few weeks in formal training, the additional 10 months of EWI education should have a significant impact on job satisfaction as supported by the variance analysis. Finally, more meaningful information regarding EWI officers' abilities, performance, and work attitudes could be obtained by a research design that investigates the opinions of supervisors, co-workers, and subordinates of EWI and non-EWI contracting/manufacturing officers (Tracey, 1984).

Although the data analysis shows that the EWI officers perceive EWI as a unique program for understanding private industry's contracting/manufacturing processes and its business environment, the halo effect may be influencing the responses (Ivancevich and Matteson, 1987). If the EWI officers believe their selection to the EWI program was a reward, then it is possible that the officers may be influenced to perceive this program as "special" and thus "unique" as well.

Unfortunately, the survey did not ask the comparison group if they thought EWI was "unique." The reason for this oversight was that the researcher believed that officers not attending EWI would lack an understanding of the EWI program and its objectives. Without this common knowledge and understanding, the opinions of the comparison group could be inaccurate. The researcher also believed it was impractical to provide a common knowledge and understanding to the comparison group in order to assess the uniqueness of EWI.

Finally, the EWI officers indicate their private industry experience provided an "edge" over those contracting/manufacturing officers who did not attend EWI. This finding also seems to support the perception that officers receive unique private industry knowledge and education through EWI.

The halo effect could also be influencing an EWI officer's positive view of the private industry experience (Ivancevich and Matteson, 1987). If the EWI officers have perceived their selection to EWI as a reward, then it is possible these officers may be influenced to view the overall EWI experience as positive regardless of their actual experiences. This explanation certainly seems to have merit, since an overwhelming number

of the EWI officers surveyed had no prior experience in the contracting/manufacturing specialty before attending EWI.

Analyses of the EWI education items (63-72) also confirms that officers who attended EWI believe their private industry education provided them with an "edge" over an officer who did not attend EWI. First, EWI graduates indicate that knowing private industry's contracting/manufacturing process is beneficial to their Air Force careers (Appendix F, item 65). Secondly, these officers also indicate knowing private industry's business environment is just as important (Appendix F, item 67). Finally, nearly all EWI officers (80%) expect to apply more of their EWI-learned knowledge as they progress through their careers (Appendix F, item 72).

The intent of this study was to determine the value of the EWI program by focusing on added value or benefits to the EWI participants and later to the Air Force. Contrary to the researcher's expectations, the research findings indicate that the EWI treatment seems to have no positive impact on the measures of intent to remain in the Air Force for 20 years or on positive work attitudes. In both areas, the data analysis failed to confirm that EWI had a positive impact.

The research indicated relatively senior officers were selected to attend EWI, officers seemingly already intending to remain in the Air Force for 20 years. Additionally, the data disclosed that the majority of EWI participants had less than one year of experience in the career specialty prior to entering EWI; however, Whitehead's theory appears to have been supported by the EWI respondents' recommendation for at least 12 months of contracting/manufacturing experience prior to entering EWI.

An exposure to novel information or knowledge (romance stage) is essential in successfully acquiring more detailed knowledge in the subsequent education stages posed by Whitehead (1957).

Perhaps the variables in the proposed hypotheses were not appropriate measures to determine the added value of EWI. Since most managers already hold positive attitudes, most current management development programs are not interested in changing attitudes (Sweetland, 1978). Instead, management development programs should show managers how to use these positive attitudes more effectively (Sweetland, 1978).

Conversely, the responses of former EWI participants supported Hypotheses 3 and 4. Given this apparent contradiction between the findings in Hypotheses 1 and 2 and Hypotheses 3 and 4, the research design may not have truly been able to measure the value of EWI. Chapter II addressed several research methods and approaches which future EWI evaluations may incorporate to provide more accurate and meaningful results. As suggested by the literature, an opinion survey is less reliable than objective measures on specific variables or outcomes (Sweetland, 1978). Moreover, a longitudinal research design with random selection of the comparison and treatment group would be more conclusive than an ex post facto cross-sectional design (Mohr, 1988). A longitudinal study would eliminate the bias in the treatment and minimize the effect of history. Additionally, a research design involving a pre-test and post-test was suggested by the literature as being more accurate; however, Mohr (1988) stated that the pre-test would become part of the treatment process.

Future Research

Future EWI evaluations could investigate comments regarding apparent negative sentiments toward EWI graduates by non-EWI officers. For the EWI experience to truly have a positive impact on the participant and the Air Force, non-participants must also perceive EWI as a benefit to the Air Force. In future evaluations, the length of the program should be reviewed (Tracey, 1968). Most of the EWI respondents recommended a program length of 12-18 months. Is that too long from an opportunity cost standpoint or just right to fully absorb the private industry experience?

The EWI program can be described as having objectives identical to a management development program (Tracey, 1984). For example, the EWI program helps contracting/manufacturing officers become more effective in their jobs by exposing them to the private industry contracting/manufacturing process as well as the business environment. Consequently, the EWI officer believes this private industry experience prepares him/her for more challenging jobs in the future and thereby extends his/her years of service and usefulness to the Air Force.

As a management education program, EWI exposes Air Force officers to new perspectives, contrasting assumptions, and knowledge of private industry (Branscomb & Gilmore, 1975). Black (1979) states that an organization needs development programs to maintain a supply of managers. In this sense, the EWI program acts as a pipeline by annually cross-training approximately 55 officers into the contracting/manufacturing career field. By supporting these manpower

needs, the EWI program helps to improve the overall effectiveness of the Air Force (Black, 1979).

EWI provides a way to overcome the obstacles mentioned by Livingston (1983) to a manager's traditional development through job rotation. By placing a contracting/manufacturing officer in the private industry environment for 10 months, EWI accelerates the frequency and depth of government-private industry management experiences by working alongside their private industry counterparts. Thus, time and cost required for developing a manager through traditional job rotation is reduced by this 10-month experience with private industry.

In summary, the statistical results appear to provide conflicting information. The tests for Hypotheses 1 and 2 failed to confirm EWI as a significant contributor to intent to remain in the Air Force for 20 years as well as to more positive work attitudes. However, the results from Hypotheses 3 and 4 appear to conclude EWI does provide the EWI officer and the Air Force with added value.

Recommendations

Based on this summative evaluation and the previous discussion, this research can not unconditionally support either a recommendation to continue or discontinue the current EWI program. However, further research is recommended to construct a more objective, formative evaluation approach using Mohr's impact analysis principles of the outcome line and program sub-objectives.

Appendix A: Air Force Institute of Technology
Survey of Contracting Officers/Manufacturing Managers



DEPARTMENT OF THE AIR FORCE
AIR UNIVERSITY
AIR FORCE INSTITUTE OF TECHNOLOGY
WRIGHT-PATTERSON AIR FORCE BASE OH 45433-6583

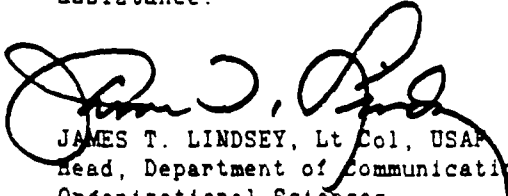
REPLY TO
ATTN OF LSR (Capt Hernandez, AUTOVON 785-5435)

10 JUL 1989

SUBJECT AFIT Research of Education With Industry (EWI) Program

TO Air Force Contracting Officers/Manufacturing Managers

1. AFIT is conducting research to better understand the relative impact of the Education With Industry (EWI) Program upon Air Force contracting officers/manufacturing managers.
2. Your replies to the enclosed questionnaire will provide valuable information for this research and may influence the future role and content of the EWI program for Air Force contracting officers/manufacturing managers.
3. Your voluntary responses will be confidential and no individuals or organizations will be identified in connection with this survey.
4. Please return the questionnaire and your answer sheet in the enclosed, pre-addressed envelope within 7 days after receipt. Thank you for your assistance.


JAMES T. LINDSEY, Lt Col, USAF
Head, Department of Communication and
Organizational Sciences
School of Systems and Logistics

- 3 Atch
1. Questionnaire
2. Answer sheet
3. Envelope

AIR FORCE INSTITUTE OF TECHNOLOGY

SURVEY OF CONTRACTING OFFICERS/MANUFACTURING MANAGERS

The purpose of this questionnaire is to obtain information about you, your job, and your career goals. Specifically, this information will support research regarding the role and impact of the AFIT Education With Industry (EWI) Program within the Air Force.

GENERAL INSTRUCTIONS

This questionnaire contains 77 items (individual "questions"). The questionnaire booklet is divided into three parts. Part I contains 58 items while Part II and Part III contain 19 items each.

Fill in the appropriate block for your answer on the enclosed answer sheet for the corresponding question number. If, for any item, you do not find a response that fits your situation exactly, please select the response which is closest to the way you feel.

Please use a "soft lead" (No. 2) pencil, and observe the following guidelines:

1. Make heavy black marks that fill in the space (of the selected response).
2. Erase cleanly any responses you wish to change.
3. Make no stray markings of any kind on the response sheet.
4. Do not staple, fold, or tear the response sheet.
5. Do NOT fill in your name on the questionnaire or answer sheet so your responses will be anonymous.

Thank you for your cooperation in participating in this study. If you have any questions, please contact the researcher at the following address:

Ed Hernandez, Capt, USAF
AFIT/LSG
Wright-Patterson AFB, OH 45433
Telephone: AUTOVON 785-5435

PART I.

BACKGROUND INFORMATION

This part of the questionnaire contains several items concerning personal characteristics. This information will help provide the background of a "typical contracting officer/manufacturing manager."

Please mark your answer on the questionnaire and then blacken the appropriate block on the answer sheet.

1. Your age is:

1. Less than 20
2. 20 - 25
3. 26 - 30
4. 31 - 35
5. 36 - 40
6. 41 - 45
7. More than 45

2. Your highest education level obtained is:

1. Some College work
2. Bachelor's degree
3. Some graduate work
4. Master's degree
5. Some doctoral work
6. Doctoral degree
7. Other

3. Your sex is:

1. Female
2. Male

4. Your present marital status is:

1. Never married
2. Married
3. Separated
4. Divorced
5. Widowed

5. Total months in your current job:

1. Less than 1 month
2. 1 month but less than 6 months
3. 6 months but less than 12 months
4. 12 months but less than 18 months
5. 18 months but less than 24 months
6. 24 months but less than 30 months
7. 30 months but less than 36 months
8. 36 months or more.

6. Is your present job a rated supplement assignment for you?
1. Yes
 2. No
7. Your rank is:
1. Second Lieutenant
 2. First Lieutenant
 3. Captain
 4. Major
 5. Lt Colonel
8. The total number of years of your military service is:
1. Less than 3 years
 2. 3 years but less than 4 years
 3. 4 years but less than 5 years
 4. 5 years but less than 6 years
 5. 6 years but less than 7 years
 6. 7 years but less than 8 years
 7. 8 years but less than 9 years
 8. 9 years but less than 10 years
 9. 10 years or more.
9. The number of years you served as prior enlisted is:
1. None
 2. Less than 1 year
 3. 1 year but less than 2 years
 4. 2 years but less than 3 years
 5. 3 years but less than 4 years
 6. 4 years but less than 5 years
 7. 5 years but less than 6 years
 8. 6 years but less than 7 years
 9. 7 years or more.
10. Your source of commission is:
1. OTS
 2. ROTC
 3. Service academy
 4. Other
11. Your current duty Air Force Specialty Code is:
1. 652X
 2. 653X
 3. 651X
 4. Other than 65XX

12. The total number of years you have worked in the Air Force as your current specialty is:
1. Less than 3 years
 2. 3 years but less than 4 years
 3. 4 year but less than 5 years
 4. 5 years but less than 6 years
 5. 6 years but less than 7 years
 6. 7 years but less than 8 years
 7. 8 years or more.
13. The combined total of Air Force contracting/manufacturing management training you have received (excluding EWI) is:
1. Less than 1 week
 2. 1 week but less than 4 weeks
 3. 4 weeks but less than 8 weeks
 4. 8 weeks but less than 12 weeks
 5. 12 weeks but less than 16 weeks
 6. 16 weeks but less than 20 weeks
 7. 20 weeks or more.
14. Did you participate in the Education With Industry program as a contracting/manufacturing manager?
1. Yes
 2. No
15. What are your current intentions toward remaining in the Air Force for at least 20 years?
1. Not applicable, I have already completed 20 years of service.
 2. Definitely will not remain in the Air Force.
 3. Probably will not remain in the Air Force.
 4. Leaning toward not remaining in the Air Force.
 5. Undecided
 6. Leaning toward remaining in the Air Force.
 7. Probably will remain in the Air Force.
 8. Definitely will remain in the Air Force.

JOB SATISFACTION

Below are 5 items which relate to the degree to which you are satisfied with various aspects of your job. Read each item carefully and choose the statement below which best represents your opinion.

- 1 = Delighted
- 2 = Pleased
- 3 = Mostly satisfied
- 4 = Mixed (about equally satisfied and dissatisfied)
- 5 = Mostly dissatisfied
- 6 = Unhappy
- 7 = Very unhappy

- 16. How do you feel about your job?
- 17. How do you feel about the people you work with -- your co-workers?
- 18. How do you feel about the work you do on your job -- the work itself?
- 19. How do you feel about the atmosphere where you work -- the physical surroundings, the hours, the amount of work you are asked to do?
- 20. How do you feel about the resources available for doing your job -- such as equipment, information, good supervision, training, etc.?

SUPERVISOR'S FEEDBACK OF YOUR PERFORMANCE

The following statements deal with feedback you receive from your supervisor concerning your performance. Your frame of reference should be your supervisor's evaluation of your performance in terms of formal feedback (i.e., OES) and informal feedback (i.e., verbal communication on a daily basis). Please think carefully about his/her evaluations of you over the past 12 months or so.

Based upon the feedback you have received from your supervisor, use the rating scale below to indicate how your job performance would compare with other employees doing similar work.

- 1 = Far worse
- 2 = Much worse
- 3 = Slightly worse
- 4 = About average
- 5 = Slightly better
- 6 = Much better
- 7 = Far better

- 21. Compared with other employees doing similar work, your supervisor considers the quantity of the work you produce to be:
- 22. Compared with other employees doing similar work, your supervisor considers the quality of the work you produce to be:
- 23. Compared with other employees doing similar work, your supervisor believes the efficiency of your use of available resources (money, materials, personnel) in producing a work product is:
- 24. Compared with other employees doing similar work, your supervisor considers your ability in anticipating problems and either preventing or minimizing their effects to be:
- 25. Compared with other employees doing similar work, your supervisor believes your adaptability/flexibility in handling high-priority work (i.e., "crash projects" and sudden schedule changes) is:

JOB EFFORT RATING

- 26. As fairly and objectively as you can, rate the level of effort you normally put into doing your work.
- 1 = Very little effort
 - 2 = Enough effort to get by
 - 3 = Moderate effort
 - 4 = More effort than most
 - 5 = Very much effort

UNIT INFORMATION

"Unit" is defined as the office or work group, either matrix or functional, to which you feel most closely attached.

The following series of statements represents possible feelings that individuals might have about their unit. Use the following rating scale to indicate your feelings about the unit for which you are now working.

- 1 Means you strongly disagree with the statement.
 - 2 Means you moderately disagree with the statement.
 - 3 Means you slightly disagree with the statement.
 - 4 Means you neither agree nor disagree with the statement.
 - 5 Means you slightly agree with the statement.
 - 6 Means you moderately agree with the statement.
 - 7 Means you strongly agree with the statement.
-
27. I am willing to put in a great deal of effort beyond that normally expected in order to help this unit be successful.
 28. I talk up this unit to my friends as a great unit to work for.
 29. I feel very little loyalty to this unit.
 30. I would accept almost any type job assignment in order to keep working for this unit.
 31. I find that my values and the unit's values are very similar.
 32. I am proud to tell others that I am part of this unit.
 33. I could just as well be working for a different unit as long as the type of work was similar.
 34. This unit really inspires me to be the best at my job.
 35. It would take very little negative change in my present circumstances to cause me to leave this unit.
 36. I am extremely glad that I chose this unit to work for over others I was considering at the time.
 37. There's not too much to be gained by sticking with this unit indefinitely.
 38. I often find it difficult to agree with this unit's policies on important matters relating to its employees.
 39. I really care about the fate of this unit.
 40. I believe this is the best of all possible units for which to work.
 41. Deciding to work for this unit was definitely a mistake on my part.

JOB INFORMATION

Use the following rating scale for the next 15 items to express your own feelings about your present job or work.

- 1 Means you strongly disagree with the statement.
 - 2 Means you moderately disagree with the statement.
 - 3 Means you slightly disagree with the statement.
 - 4 Means you neither agree nor disagree with the statement.
 - 5 Means you slightly agree with the statement.
 - 6 Means you moderately agree with the statement.
 - 7 Means you strongly agree with the statement.
-
42. I often use the skills I learned for my job.
 43. I often have an opportunity to try out my own ideas.
 44. I often have a chance to do things my own way.
 45. I often have a chance to do the kinds of things that I do best.
 46. I often feel at the end of the day that I've accomplished something.
 47. The most important things that happen to me involve my work.
 48. The most important things I do involve my work.
 49. The major satisfaction in my life comes from my job.
 50. The activities which give me the greatest pleasure and personal satisfaction involve my job.
 51. I live, eat, and breathe my job.
 52. I would rather get a job promotion than be a more important member of my club, church, or lodge.
 53. How well I perform on my job is extremely important to me.
 54. I feel badly if I don't perform well on my job.
 55. I am very personally involved in my work.
 56. I avoid taking on extra duties and responsibilities.

GOAL AGREEMENT

57. How compatible are your unit's goals with your own personal goals?

- 1 = Not at all
- 2 = To a very little extent
- 3 = To a little extent
- 4 = To a moderate extent
- 5 = To a fairly large extent
- 6 = To a great extent
- 7 = To a very great extent

SELF-PERCEIVED ABILITY

58. Compared to others whose job are similar to yours, how would you rate your ability to perform the work?

- 1 = Much less ability than others
- 2 = Less ability than others
- 3 = Same ability as others
- 4 = More ability than others
- 5 = Much more ability than others

IF YOU DID NOT ATTEND EWI, PLEASE STOP!!

PLEASE TAKE YOUR RESPONSES FROM THE QUESTIONNAIRE AND FILL IN YOUR ANSWER SHEET NOW. MAKE SURE YOU HAVE ANSWERED ALL THE QUESTIONS AND YOU HAVE BLACKENED IN THE APPROPRIATE BLOCKS ON THE ANSWER SHEET.

PLEASE PUT THE QUESTIONNAIRE AND YOUR ANSWER SHEET IN THE PRE-ADDRESSED ENVELOPE AND MAIL IT.

THANK YOU FOR YOUR COOPERATION!

IF YOU ATTENDED EWI AS A MANUFACTURING MANAGER (652X),
PLEASE TURN TO PART II, QUESTION #59 AND CONTINUE THIS QUESTIONNAIRE.

IF YOU ATTENDED EWI AS A CONTRACTING OFFICER (653X),
PLEASE TURN TO PART III, QUESTION #59 AND CONTINUE THIS QUESTIONNAIRE.

PART II.

EDUCATION WITH INDUSTRY

This part requests information about the EWI program. The questions will provide data regarding the EWI program and your EWI experiences.

Please mark your answer on the questionnaire and then blacken the appropriate block on the answer sheet.

59. The number of years of your military service prior to entering EWI is:

1. Less than 3 years
2. 3 years but less than 4 years
3. 4 years but less than 5 years
4. 5 years but less than 6 years
5. 6 years but less than 7 years
6. 7 years but less than 8 years
7. 8 years or more.

60. The number of years experience as an Air Force manufacturing manager prior to entering EWI is:

1. None
2. Less than 1 year
3. 1 year but less than 2 years
4. 2 years but less than 3 years
5. 3 years but less than 4 years
6. 4 years but less than 5 years
7. 5 years but less than 6 years
8. 6 years or more.

61. How long since you completed your EWI education?

1. Less than 1 year
2. 1 year but less than 2 years
3. 2 years but less than 3 years
4. 3 years but less than 4 years
5. 4 years but less than 5 years
6. 5 years but less than 6 years
7. 6 years or more.

62. The total number of Air Force manufacturing management courses you have taken during your career is:

1. None
2. 1
3. 2
4. 3
5. 4
6. 5
7. 6 or more.

EWI EDUCATION

For the following items, indicate the response which more closely describes your answer using the rating scale shown below. Please answer all questions.

- 1 Means you strongly disagree with the statement.
- 2 Means you moderately disagree with the statement.
- 3 Means you slightly disagree with the statement.
- 4 Means you neither agree nor disagree with the statement.
- 5 Means you slightly agree with the statement.
- 6 Means you moderately agree with the statement.
- 7 Means you strongly agree with the statement.

63. I have learned more job skills from Air Force manufacturing management training courses than from my EWI education.
64. I have applied more job skills learned from Air Force manufacturing management courses than from my EWI education.
65. Knowing private industry's manufacturing process is beneficial to my Air Force career.
66. Other Air Force training I have completed gave me better knowledge about private industry's manufacturing process than EWI did.
67. Knowing private industry's business environment is as important as knowing its manufacturing process for doing my job.
68. Other Air Force training I have completed gave me better knowledge about private industry's business environment than EWI did.
69. I believe my industry experience in EWI provided me with an "edge" over manufacturing managers not attending EWI.
70. I use my EWI-related knowledge and skills a lot on my current job.
71. I look for jobs that allow me to use my EWI experience.
72. I expect to apply more of my EWI knowledge as I progress through my Air Force career.

For the following items, indicate the response which more closely describes your answer using the rating scale provided.

73. Overall, I would rate the EWI Program Manager's support to me as:

Nonexistent				Adequate				Excellent
1-----	2-----	3-----	4-----	5-----	6-----	7-----		

74. Overall, I would rate the EWI staff's (AFIT/CIS) support to me as:

Nonexistent				Adequate				Excellent
1-----	2-----	3-----	4-----	5-----	6-----	7-----		

75. How much EWI orientation would you recommend before entering the program?

Much less				The same				Much more
1-----	2-----	3-----	4-----	5-----	6-----	7-----		

76. How much Air Force manufacturing management experience would you recommend a student have before attending EWI?

None	6 Months	12 Months	18 Months	24 Months	30 Months	31 or more
1-----	2-----	3-----	4-----	5-----	6-----	7-----

77. Generally, I would rate my EWI education experience as:

Very bad				Neutral				Extremely positive
1-----	2-----	3-----	4-----	5-----	6-----	7-----		

THIS CONCLUDES THE SURVEY

PLEASE PUT THE QUESTIONNAIRE AND YOUR ANSWER SHEET IN THE PRE-ADDRESSED ENVELOPE AND MAIL IT.

IF YOU WOULD LIKE AN EXECUTIVE SUMMARY OF THE RESEARCH RESULTS, PLEASE SEND YOUR REQUEST TO:

CAPT ED HERNANDEZ
AFIT/LSG
WPAFB, OH 45433-6583

THANK YOU FOR YOUR COOPERATION!

PART III.

EDUCATION WITH INDUSTRY

This part requests information about the EWI program. The questions will provide data regarding the EWI program and your EWI experiences.

Please mark your answer on the questionnaire and then blacken the appropriate block on the answer sheet.

59. The number of years of your military service prior to entering EWI is:

1. Less than 3 years
2. 3 years but less than 4 years
3. 4 years but less than 5 years
4. 5 years but less than 6 years
5. 6 years but less than 7 years
6. 7 years but less than 8 years
7. 8 years or more.

60. The number of years experience as an Air Force contracting officer prior to entering EWI is:

1. None
2. Less than 1 year
3. 1 year but less than 2 years
4. 2 years but less than 3 years
5. 3 years but less than 4 years
6. 4 years but less than 5 years
7. 5 years but less than 6 years
8. 6 years or more.

61. How long since you completed your EWI education?

1. Less than 1 year
2. 1 year but less than 2 years
3. 2 years but less than 3 years
4. 3 years but less than 4 years
5. 4 years but less than 5 years
6. 5 years but less than 6 years
7. 6 years or more.

62. The total number of Air Force contract management courses you have taken during your career is:

1. None
2. 1
3. 2
4. 3
5. 4
6. 5
7. 6 or more.

EWI EDUCATION

For the following items, indicate the response which more closely describes your answer using the rating scale shown below. Please answer all questions.

- 1 Means you strongly disagree with the statement.
- 2 Means you moderately disagree with the statement.
- 3 Means you slightly disagree with the statement.
- 4 Means you neither agree nor disagree with the statement.
- 5 Means you slightly agree with the statement.
- 6 Means you moderately agree with the statement.
- 7 Means you strongly agree with the statement.

63. I have learned more job skills from Air Force contract management training courses than from my EWI education.
64. I have applied more job skills learned from Air Force contract management courses than from my EWI education.
65. Knowing private industry's contracting process is beneficial to my Air Force career.
66. Other Air Force training I have completed gave me better knowledge about private industry's contracting process than EWI did.
67. Knowing private industry's business environment is as important as knowing its contracting process for doing my job.
68. Other Air Force training I have completed gave me better knowledge about private industry's business environment than EWI did.
69. I believe my industry experience in EWI provided me with an "edge" over contracting officers not attending EWI.
70. I use my EWI-related knowledge and skills a lot on my current job.
71. I look for jobs that allow me to use my EWI experience.
72. I expect to apply more of my EWI knowledge as I progress through my Air Force career.

For the following items, indicate the response which more closely describes your answer using the rating scale provided.

73. Overall, I would rate the EWI Program Manager's support to me as:

Nonexistent		Adequate		Excellent
1-----	2-----	3-----	4-----	5-----6-----7

74. Overall, I would rate the EWI staff's (AFIT/CIS) support to me as:

Nonexistent		Adequate		Excellent
1-----	2-----	3-----	4-----	5-----6-----7

75. How much EWI orientation would you recommend before entering the program?

Much less		The same		Much more
1-----	2-----	3-----	4-----	5-----6-----7

76. How much Air Force contract management experience would you recommend a student have before attending EWI?

None	6	12	18	24	30	31 or more
	Months	Months	Months	Months	Months	
1-----	2-----	3-----	4-----	5-----	6-----	7

77. Generally, I would rate my EWI education experience as:

Very bad		Neutral		Extremely positive
1-----	2-----	3-----	4-----	5-----6-----7

THIS CONCLUDES THE SURVEY

PLEASE PUT THE QUESTIONNAIRE AND YOUR ANSWER SHEET IN THE PRE-ADDRESSED ENVELOPE AND MAIL IT.

IF YOU WOULD LIKE AN EXECUTIVE SUMMARY OF THE RESEARCH RESULTS, PLEASE SEND YOUR REQUEST TO:

CAPT ED HERNANDEZ
AFIT/LSG
WPAFB, OH 45433-6583

THANK YOU FOR YOUR COOPERATION!

Appendix B: Survey Pilot Study Panel

Captain Mary Farquhar

Captain Greg Garrett^{*}

Captain Bill Kent^{*}

Captain Pete Leahy

Captain Garry Shafovaloff

Captain David Steenbarger^{*}

^{*} Graduates of EWI Contracting/Manufacturing Option

Appendix C: Population, Sample Statistics and
Derivation of Sample Size for Comparison Group

Table 12. 65XX Personnel by Rank

Rank	N	Percent
0-1*	-	-
0-2*	187	13.3
0-3	641	45.5
0-4	322	22.8
0-5	197	14.0
0-6	93	6.6
TOTAL	1,440	102.1

* First and Second Lieutenants Grouped Together

Table 13. 65XX Personnel by Rank**

Rank	N	Percent
0-1*	-	-
0-2	173	13.3
0-3	635	48.8
0-4	320	24.6
0-5	165	12.7
0-6	8	0.6
TOTAL	1,301	100.0

* First and Second Lieutenants Grouped Together

** Excludes 654X Specialty (Manufacturing Engineer)

Table 14. 65XX Personnel by Rank: Captain through Colonel**

Rank	N	Percent
0-3	635	56.3
0-4	320	28.4
0-5	165	14.6
0-6	8	0.7
TOTAL	1,128	100.0

**Excludes 654X Specialty (Manufacturing Engineer)

Table 15. Survey Sample by Rank**

Rank	N	Percent
0-1	-	-
0-2	1	0.4
0-3	173	66.8
0-4	80	30.9
0-5	5	1.9
TOTAL	259	100.0

**Excludes 654X Specialty (Manufacturing Engineer)

Sample Size Formula:

$$n = \frac{N * Z^2 * p*q}{(N-1) (D^2) + (Z^2) (p*q)} \quad (1)$$

where

n = Sample size

N = Population size

Z = Standard deviation for desired alpha

p = Proportion of population in central/systems positions (.5)

q = Proportion of population not in central/systems positions (.5)

D = Desired Tolerance (.1)

Appendix D: Demographic Statistics of Respondents

Table 16. Age in Years

<u>Code</u>	<u>Category</u>	<u>Frequencies</u>		
		<u>Count</u>	<u>Adjusted %</u>	<u>Cumulative %</u>
1	Less than 20	0	0.0	0.0
2	20 - 25	1	.4	.4
3	26 - 30	47	16.9	17.3
4	31 - 35	112	40.3	57.6
5	36 - 40	88	31.7	89.2
6	41 - 45	30	10.8	100.0
7	45 or more	<u>0</u>	<u>0.0</u>	
	TOTAL	<u>278</u>	<u>100.0</u>	
Mean: 4.36		Mode: 4.00	Median: 4.00	

Table 17. Education Level

<u>Code</u>	<u>Category</u>	<u>Frequencies</u>		
		<u>Count</u>	<u>Adjusted %</u>	<u>Cumulative %</u>
1	Some College Work	0	0.0	0.0
2	Bachelor's Degree	8	2.9	2.9
3	Some Graduate Work	40	14.4	17.3
4	Master's Degree	215	77.3	94.6
5	Some Doctoral Work	7	2.5	97.1
6	Doctoral Degree	6	2.2	99.3
7	Other	<u>2</u>	<u>.7</u>	100.0
	TOTAL	<u>278</u>	<u>100.0</u>	
Mean: 3.89		Mode: 4.00	Median: 4.00	

Table 18. Sex of Respondent

<u>Code</u>	<u>Category</u>	<u>Frequencies</u>		
		<u>Count</u>	<u>Adjusted %</u>	<u>Cumulative %</u>
1	Female	36	12.9	12.9
2	Male	242	87.1	100.0
	TOTAL	278	100.0	
Mean: 1.87		Mode: 2.00	Median: 2.00	

Table 19. Marital Status of Respondent

<u>Code</u>	<u>Category</u>	<u>Frequencies</u>		
		<u>Count</u>	<u>Adjusted %</u>	<u>Cumulative %</u>
1	Never Married	38	13.7	13.7
2	Married	224	80.6	94.2
3	Separated	5	1.8	96.0
4	Divorced	11	4.0	100.0
5	Widowed	0	0.0	
	TOTAL	278	100.0	
Mean: 1.96		Mode: 2.00	Median: 2.00	

Table 20. Time in Current Job

<u>Code</u>	<u>Category</u>	<u>Frequencies</u>		
		<u>Count</u>	<u>Adjusted %</u>	<u>Cumulative %</u>
1	Less than 1 month	15	5.4	5.4
2	1 month but less than 6	33	11.9	17.3
3	6 months but less than 12	59	21.2	38.5
4	12 months but less than 18	59	21.2	59.7
5	18 months but less than 24	33	11.9	71.6
6	24 months but less than 30	35	12.6	84.2
7	30 months but less than 36	14	5.0	89.2
8	36 months or more	<u>30</u>	<u>10.8</u>	100.0
TOTAL		<u>278</u>	<u>100.0</u>	
Mean: 4.34		Mode: 3.00	Median: 4.00	

Table 21. Rated Supplement Assignment

<u>Code</u>	<u>Category</u>	<u>Frequencies</u>		
		<u>Count</u>	<u>Adjusted %</u>	<u>Cumulative %</u>
1	Yes	27	9.7	9.7
2	No	<u>251</u>	<u>90.3</u>	100.0
TOTAL		<u>278</u>	<u>100.0</u>	
Mean: 1.90		Mode: 2.00	Median: 2.00	

Table 22. Officer Rank

<u>Code</u>	<u>Category</u>	<u>Frequencies</u>		
		<u>Count</u>	<u>Adjusted %</u>	<u>Cumulative %</u>
1	2nd Lieutenant	0	0.0	0.0
2	1st Lieutenant	1	0.4	0.4
3	Captain	181	65.3	65.7
4	Major	89	32.1	97.8
5	Lt Colonel	<u>6</u>	<u>2.2</u>	100.0
	TOTAL	<u>278</u>	<u>100.0</u>	
Mean: 3.36		Mode: 3.00	Median: 3.00	

Table 23. Length of Military Service

<u>Code</u>	<u>Category</u>	<u>Frequencies</u>		
		<u>Count</u>	<u>Adjusted %</u>	<u>Cumulative %</u>
1	Less than 3 years	0	.0	.0
2	3 but less than 4 years	2	.7	.7
3	4 but less than 5 years	11	4.0	4.7
4	5 but less than 6 years	10	3.6	8.3
5	6 but less than 7 years	9	3.2	11.5
6	7 but less than 8 years	15	5.4	16.9
7	8 but less than 9 years	21	7.6	24.5
8	9 but less than 10 years	35	12.6	37.1
9	10 years or more	<u>175</u>	<u>62.9</u>	100.0
	TOTAL	<u>278</u>	<u>100.0</u>	
Mean: 7.96		Mode: 9.00	Median: 9.00	

Table 24. Length of Enlisted Service

<u>Code</u>	<u>Category</u>	<u>Frequencies</u>		
		<u>Count</u>	<u>Adjusted %</u>	<u>Cumulative %</u>
1	None	192	69.1	69.1
2	Less than 1 year	2	.7	69.8
3	1 year but less than 2	5	1.8	71.6
4	2 years but less than 3	13	4.7	76.3
5	3 years but less than 4	14	5.0	81.3
6	4 years but less than 5	17	6.1	87.4
7	5 years but less than 6	4	1.4	88.8
8	6 years but less than 7	5	1.8	90.6
9	7 years or more	26	9.4	100.0
TOTAL		278	100.0	
Mean: 2.65		Mode: 1.00	Median: 1.00	

Table 25. Source of Commission

<u>Code</u>	<u>Category</u>	<u>Frequencies</u>		
		<u>Count</u>	<u>Adjusted %</u>	<u>Cumulative %</u>
1	OTS	115	41.4	41.4
2	ROTC	144	51.8	93.2
3	Service Academy	15	5.4	98.6
4	Other	4	1.4	100.0
TOTAL		278	100.0	
Mean: 1.67		Mode: 2.00	Median: 2.00	

Table 26. Current Duty AFSC

<u>Code</u>	<u>Category</u>	<u>Count</u>	<u>Frequencies</u>	
			<u>Adjusted %</u>	<u>Cumulative %</u>
1	652X	44	15.8	15.8
2	653X	134	48.2	64.0
3	651X	82	29.5	93.5
4	Other than 65XX	<u>18</u>	<u>6.5</u>	100.0
	TOTAL	<u>278</u>	<u>100.0</u>	
Mean: 2.27		Mode: 2.00	Median: 2.00	

Table 27. Years Experience in Current AFSC

<u>Code</u>	<u>Category</u>	<u>Count</u>	<u>Frequencies</u>	
			<u>Adjusted %</u>	<u>Cumulative %</u>
1	Less than 3 years	97	35.0	35.0
2	3 years but less than 4	35	12.6	47.6
3	4 years but less than 5	29	10.5	58.1
4	5 years but less than 6	29	10.5	68.6
5	6 years but less than 7	23	8.3	76.9
6	7 years but less than 8	11	4.0	80.9
7	8 years or more	<u>53</u>	<u>19.1</u>	100.0
	TOTAL	<u>278</u>	<u>100.0</u>	
Mean: 3.33		Mode: 1.00	Median: 3.00	

Table 28. Amount of Air Force 65XX Training

<u>Code</u>	<u>Category</u>	<u>Frequencies</u>		
		<u>Count</u>	<u>Adjusted %</u>	<u>Cumulative %</u>
1	Less than 1 week	8	2.9	2.9
2	1 week but less than 4	10	3.6	6.5
3	4 weeks but less than 8	32	11.5	18.0
4	8 weeks but less than 12	53	19.1	37.1
5	12 weeks but less than 16	51	18.3	55.4
6	16 weeks but less than 20	31	11.2	66.6
7	20 weeks or more	<u>93</u>	<u>33.5</u>	100.0
	TOTAL	<u>278</u>	<u>100.0</u>	
Mean: 5.14		Mode: 7.00	Median: 5.00	

Table 29. EWI Program Participation

<u>Code</u>	<u>Category</u>	<u>Frequencies</u>		
		<u>Count</u>	<u>Adjusted %</u>	<u>Cumulative %</u>
1	Attended EWI	163	58.6	58.6
2	Did not attend EWI	<u>115</u>	<u>41.4</u>	100.0
	TOTAL	<u>278</u>	<u>100.0</u>	
Mean: 1.41		Mode: 1.00	Median: 1.00	

Table 30. Intent to Remain in the Air Force

<u>Code</u>	<u>Category</u>	<u>Frequencies</u>		
		<u>Count</u>	<u>Adjusted %</u>	<u>Cumulative %</u>
1	Definitely will not remain	4	1.4	1.4
2	Probably will not remain	5	1.8	3.2
3	Leaning toward not remaining	5	1.8	5.0
4	Undecided	17	6.1	11.1
5	Leaning toward remaining	31	11.2	22.3
6	Probably will remain	55	19.8	42.1
7	Definitely will remain	148	53.2	95.3
8	Not applicable, already 20 years	<u>13</u>	<u>4.7</u>	100.0
	TOTAL	<u>278</u>	<u>100.0</u>	
Mean: 6.82		Mode: 7.00	Median: 7.00	

Appendix E: Correlation Matrix of Research Variables

Table 31. Pearson Correlation Matrix

[illegible]

★ $p < 0.05$ ★★ $p < 0.01$ (n=278)

Appendix F: Statistics for Part II and III Items

Table 32. Length of Service Prior to EWI

<u>Code</u>	<u>Category</u>	<u>Frequencies</u>		
		<u>Count</u>	<u>Adjusted %</u>	<u>Cumulative %</u>
1	Less than 3 years	1	0.6	0.6
2	3 years but less than 4	9	5.5	6.1
3	4 years but less than 5	25	15.2	21.3
4	5 years but less than 6	19	11.6	32.9
5	6 years but less than 7	22	13.4	46.3
6	7 years but less than 8	15	9.1	55.5
7	8 years but less than 9	<u>73</u>	<u>44.5</u>	100.0
TOTAL		<u>164</u>	<u>100.0</u>	
Mean: 5.37		Mode: 7.00	Median: 6.00	

Table 33. Years Experience as 65XX before EWI

<u>Code</u>	<u>Category</u>	<u>Frequencies</u>		
		<u>Count</u>	<u>Adjusted %</u>	<u>Cumulative %</u>
1	None	144	87.8	87.8
2	Less than 1 year	7	4.3	92.1
3	1 year but less than 2	2	1.2	93.3
4	2 years but less than 3	2	1.2	94.5
5	3 years but less than 4	4	2.4	96.9
6	4 years but less than 5	1	0.6	97.6
7	5 years but less than 6	0	0.0	97.6
8	6 years or more	<u>4</u>	<u>2.4</u>	100.0
TOTAL		<u>164</u>	<u>100.0</u>	
Mean: 1.40		Mode: 1.00	Median: 1.00	

Table 34. Years Since EWI Completion

<u>Code</u>	<u>Category</u>	<u>Frequencies</u>		
		<u>Count</u>	<u>Adjusted %</u>	<u>Cumulative %</u>
1	Less than 1 year	3	1.8	1.8
2	1 year but less than 2	35	21.3	23.2
3	2 years but less than 3	32	19.5	42.7
4	3 years but less than 4	33	20.1	62.8
5	4 years but less than 5	24	14.6	77.4
6	5 years but less than 6	24	14.6	92.1
7	6 years or more	<u>13</u>	<u>7.9</u>	100.0
	TOTAL	<u>164</u>	<u>100.0</u>	
Mean: 4.00		Mode: 2.00	Median: 4.00	

Table 35. Descriptive Statistics for Items 63-77

<u>Item</u>	<u>Mean</u>	<u>Mode</u>	<u>Median</u>
63	3.64	1.00	4.00
64	3.59	1.00	3.00
65	6.30	7.00	7.00
66*	6.30	7.00	7.00
67	5.84	7.00	6.00
68*	6.17	7.00	7.00
69	5.90	7.00	6.00
70	4.90	5.00	5.00
71	4.72	4.00	5.00
72	5.60	7.00	6.00
73	5.12	6.00	5.00
74	5.00	6.00	5.00
75	4.57	4.00	4.00
76	3.12	3.00	3.00
77	6.24	7.00	7.00

* Reverse-scaled items (All items used a 7-point Likert scale)

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4 PERFORMING ORGANIZATION REPORT NUMBER(S) AFIT/GSM/LSR/89S-18			5 MONITORING ORGANIZATION REPORT NUMBER(S)		
6a. NAME OF PERFORMING ORGANIZATION School of Systems and Logistics		6b OFFICE SYMBOL (If applicable) AFIT/LSY	7a. NAME OF MONITORING ORGANIZATION		
6c. ADDRESS (City, State, and ZIP Code) Air Force Institute of Technology Wright-Patterson AFB OH 45433-6583			7b ADDRESS (City, State, and ZIP Code)		
8a. NAME OF FUNDING/SPONSORING ORGANIZATION		8b OFFICE SYMBOL (If applicable)	9 PROCUREMENT INSTRUMENT IDENTIFICATION NUMBER		
8c. ADDRESS (City, State, and ZIP Code)			10 SOURCE OF FUNDING NUMBERS		
			PROGRAM ELEMENT NO.	PROJECT NO.	TASK NO.
			WORK UNIT ACCESSION NO.		
11. TITLE (Include Security Classification) A STUDY OF BENEFITS RESULTING FROM THE AFIT EDUCATION WITH INDUSTRY PROGRAM					
12. PERSONAL AUTHOR(S) Ed R. Hernandez, B.B.A., Captain, USAF					
13a. TYPE OF REPORT MS Thesis		13b. TIME COVERED FROM _____ TO _____		14. DATE OF REPORT (Year, Month, Day) 1989 September	
				15. PAGE COUNT 125	
16. SUPPLEMENTARY NOTATION					
17. COSATI CODES			18. SUBJECT TERMS (Continue on reverse if necessary and identify by block number)		
FIELD	GROUP	SUB-GROUP			
05	09		Personnel Management Personnel Development Management Training Education		
19 ABSTRACT (Continue on reverse if necessary and identify by block number) Thesis Advisor: James T. Lindsey, Lt Col, USAF Head, Dept of Communication and Organizational Sciences					
Approved for public release: IAW AFR 190-1. <i>Larry W. Emmelhainz</i> LARRY W. EMMELHAINZ, Lt Col, USAF 14 Oct 89 Director of Research and Consultation Air Force Institute of Technology (AU) Wright-Patterson AFB OH 45433-6583					
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This research developed a survey based on a summative evaluation framework to measure the value of the Education With Industry program. A review of the literature revealed that evaluations of management development programs suffer from a lack of objective, quantitative measures and a subsequent lack of generalizability of the evaluation results. More importantly, Tracey asserts management program evaluations suffer from a lack of ordered and valid appraisal standards. Using the summative evaluation approach, this research collected several psychometric properties from previous studies and incorporated them into a well-developed field survey.

A three-part questionnaire was developed to measure the attitudinal differences between the treatment group of EWI graduates and a comparison group consisting of similar Air Force contracting/manufacturing officers not having attended EWI. The developed field survey consisted of three parts. Part I, consisting of demographic items, was to be answered by all personnel receiving the survey. Parts II and III were to be answered only by those officers attending EWI in the manufacturing or contracting options, respectively. A pilot study determined the appropriate items and wording most suitable for the field survey. Next, the resulting field survey was administered to the EWI graduates of the 1983-1987 classes as well as a comparison group consisting of similar Air Force contracting/manufacturing officers not having attended EWI. Respondents were asked to describe their attitudes toward their work, their organization, and their intent to remain in the Air Force for 20 years.

The returned responses were evaluated for the internal reliability of several composite measures. Next, several data analysis procedures were conducted to test the proposed hypotheses. The study concluded further research, based on a formative study using Mohr's systematic outcome line and subobjectives, was required to objectively and quantitatively assess the value of the EWI program.

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